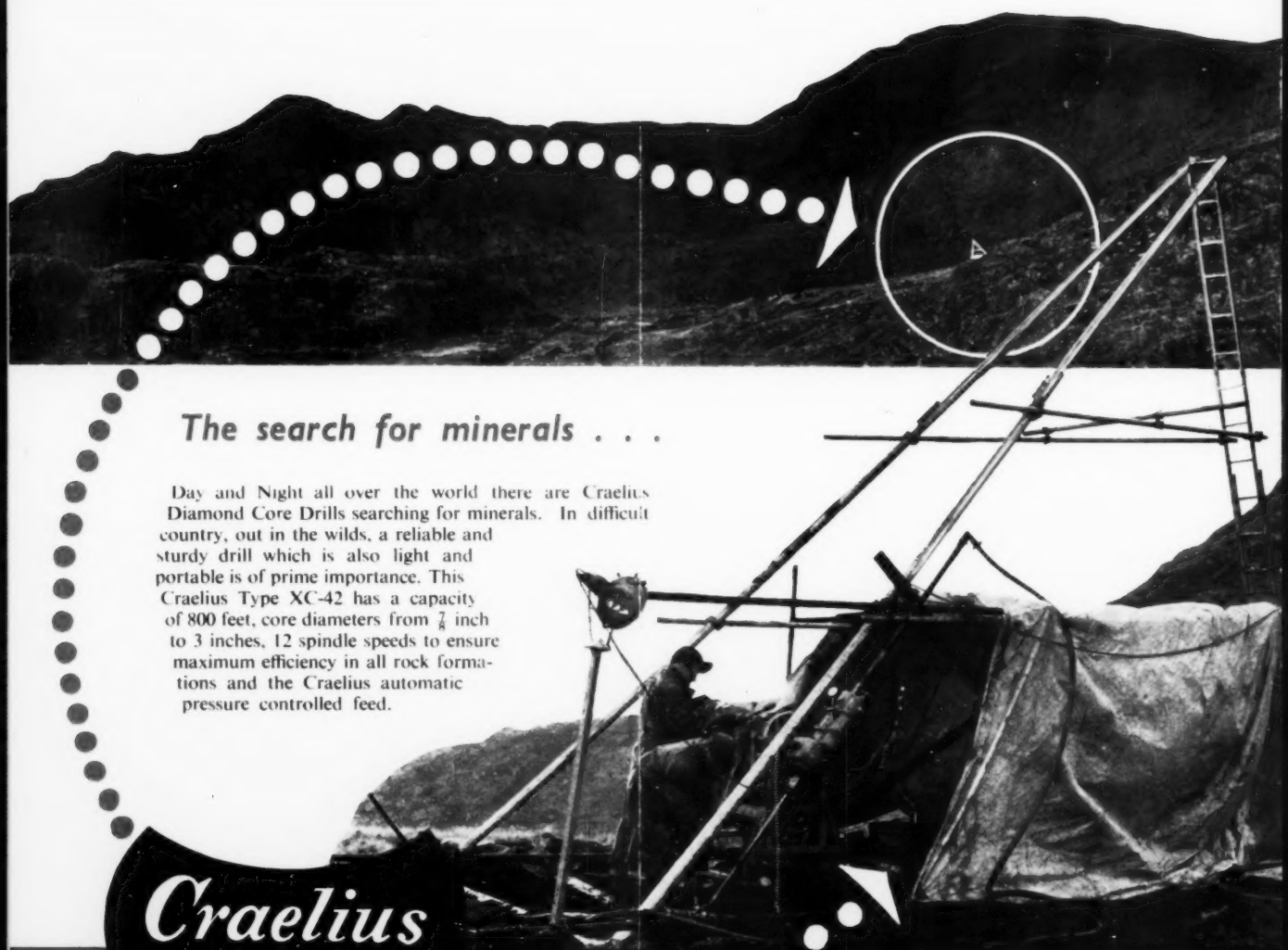
The Mining Journal

LONDON, DECEMBER 7, 1956

Vol. 247. No. 6329

Price Ninepence



The search for minerals . . .

Day and Night all over the world there are Craelius Diamond Core Drills searching for minerals. In difficult country, out in the wilds, a reliable and sturdy drill which is also light and portable is of prime importance. This Craelius Type XC-42 has a capacity of 800 feet, core diameters from $\frac{7}{8}$ inch to 3 inches, 12 spindle speeds to ensure maximum efficiency in all rock formations and the Craelius automatic pressure controlled feed.

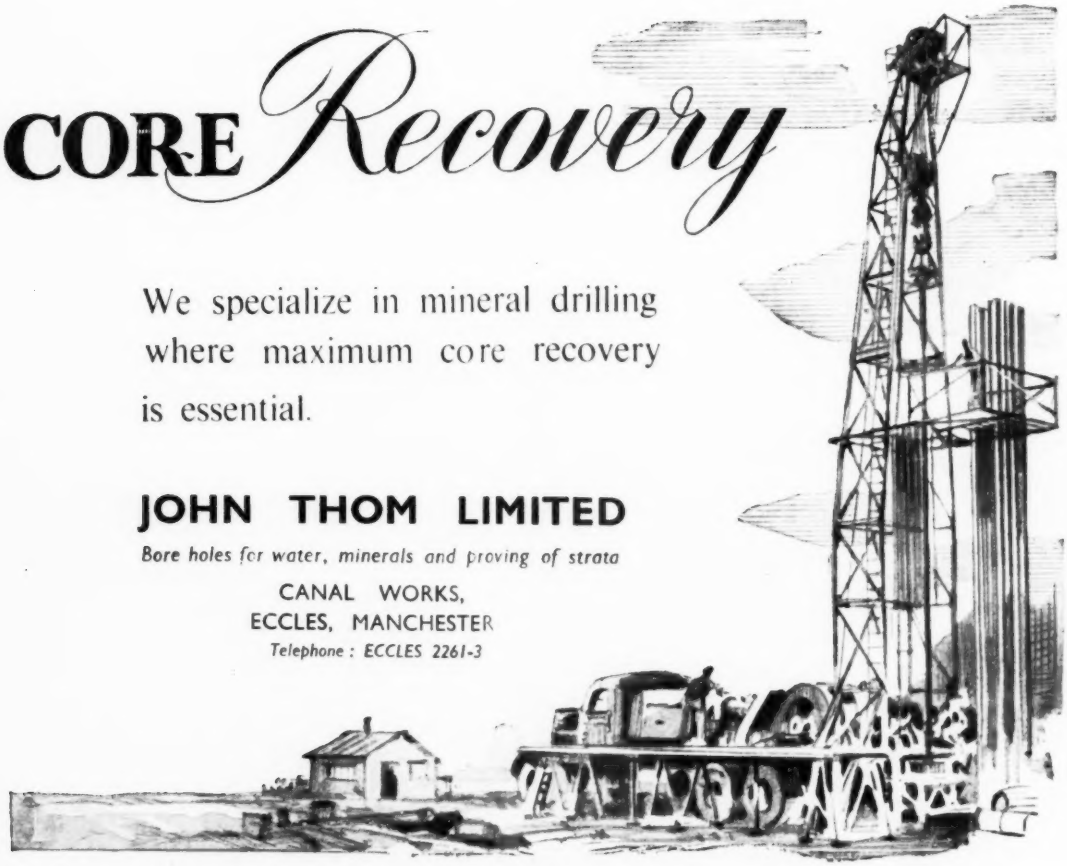
Craelius

CRAELIUS COMPANY LIMITED
12, CLARGES STREET, LONDON, W.1.
Phone: Grosvenor 1378/9.
Telegrams: Craelius, London.

Associated Companies
The Swedish Diamond Rock Drilling Co., Stockholm.
The Electrical Prospecting Co., Stockholm.
The Craelius East African Drilling Co., Ltd., Nairobi.
Societe Anonyme Craelius, Paris.

CORE *Recovery*

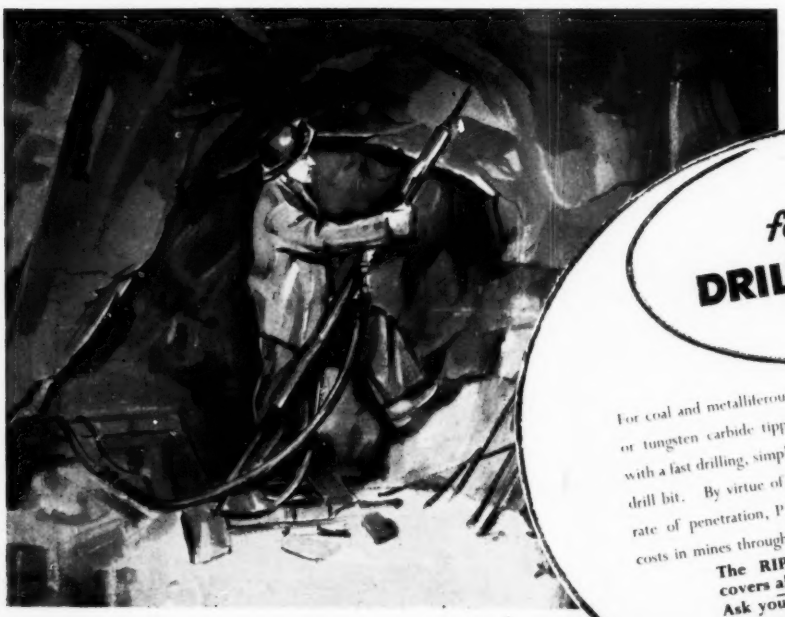
We specialize in mineral drilling where maximum core recovery is essential.



JOHN THOM LIMITED

Bore holes for water, minerals and proving of strata

CANAL WORKS,
ECCLES, MANCHESTER
Telephone : ECCLES 2261-3



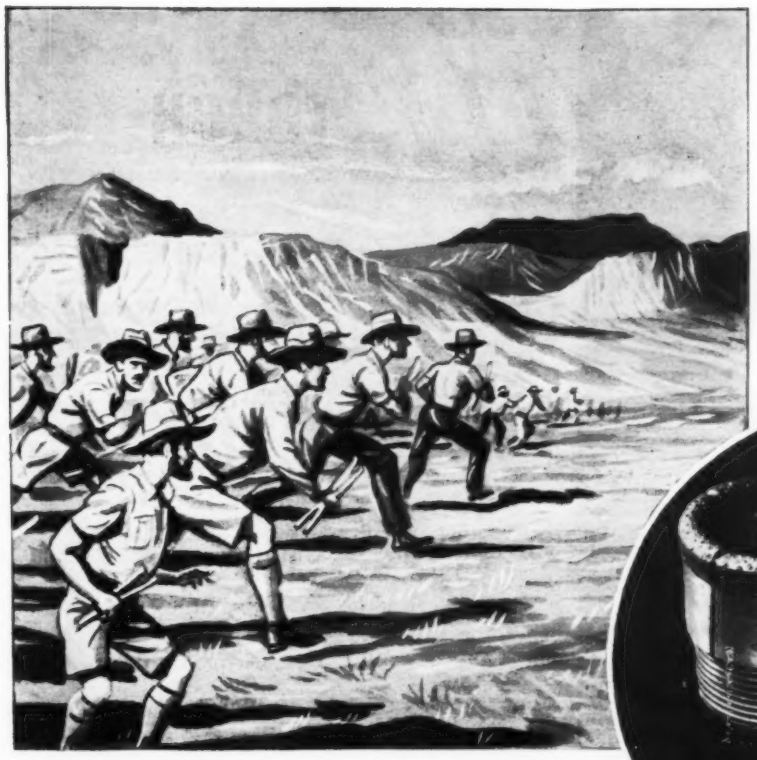
for **EVERY DRILLING JOB**

For coal and metalliferous mining the P.M. single-use or tungsten carbide tipped bit provides the operator with a fast drilling, simple-to-use and inexpensive rock drill bit. By virtue of their low initial cost and high rate of penetration, P.M. bits have reduced drilling costs in mines throughout the world.

The RIP BITS range of products covers all rock-drilling applications. Ask your supplier for details.

RIP BITS

RIP BITS LIMITED, HILL ST., SHEFFIELD 2 . Tel: 26706
London Office: 66 Victoria St. London S.W.1. Tel: TATe Gallery 0752-3



Devil take the hindmost

Near Lichtenberg, on the headwaters of the Vaal, a new diamond field was discovered some 25 years ago. Government took control. Would-be prospectors had to buy a licence. They were provided with four stakes and lined up near the diamond bearing area. At the sound of the starter's gun, they raced to stake out their claims, and so a new alluvial field was started.

The race for leadership in the diamond drilling field is just as keen. Smit's always led, but about the time of the Lichtenberg affair a very long lead was established by the Smit introduction of small drilling bortz into the crowns of mining bits. A suitable mechanical setting was evolved and the quality and efficiency of the Smit product was vastly improved and at an economic price.

It is this kind of leadership and constructive enterprise that makes it worth your while to get in touch with Smit's on any question of diamond drilling. It invariably leads to better results and greater profits.

J. K. SMIT & SONS (DIAMOND TOOLS) LTD.

22-24, Ely Place, Holborn Circus, London, E.C.1

Telephone : ★ HOLborn 6451

European, American and Canadian Offices :

J. K. Smit & Zonen Diamantgereedschappen (Diamond Tools) N.V., Sarphatistraat 66, Amsterdam (C) Holland
J. K. Smit & Fils, S.A., 25, Ru du Bac, Asnières/Seine, France
J. K. Smit & Sons, Inc., Murray Hill, New Jersey, U.S.A.
J. K. Smit & Sons of Canada Ltd., 129, Adelaide Street West, Toronto, 1

THE *Arcair* TORCH

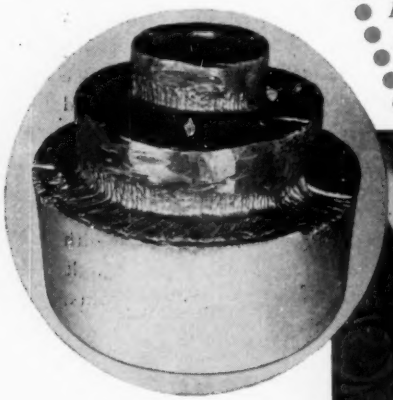
Using only electric arc and compressed air

SAVES UP TO 80%

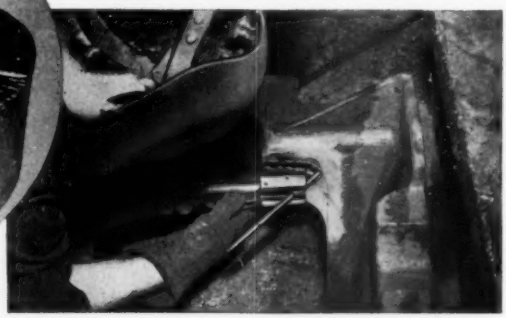
on gouging, grooving, cutting

The ARCAIR TORCH is a light, mobile tool that can be operated in a restricted space and in any position. It works on *all* metals and can be used for gouging defects, removing unwanted metal, cutting, grooving and shaping ferrous or non-ferrous metals. The depth of cut is easily regulated, welding or brazing can be done without further grinding or cleaning and slag from welding does not interfere with cutting action. The electrodes are quickly adjustable to any angle. No gas cylinders or regulators are necessary. *Outstanding for speed and economy, the* ARCAIR TORCH *has wide applications in mines, quarries and foundries.*

Padding of clutch casting removed with Arcair Torch. Note clean surface. Vertical and horizontal cuts in one operation.



- *Works on all metals*
- *Many times faster than chipping*
- *Low initial cost—low operating cost*
- *Operates on ordinary D.C. welding machine*
- *Cuts clean—no further preparation necessary for welding*
- *Easy to operate—no special skill required*



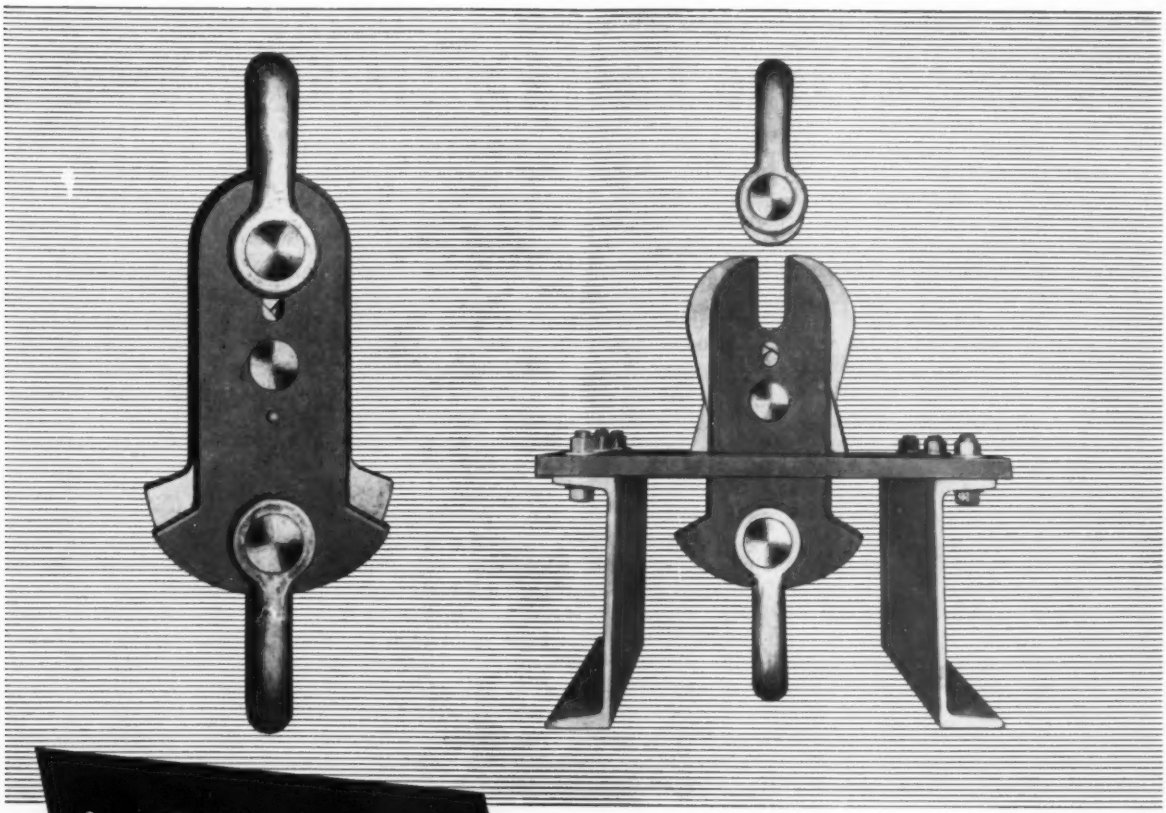
Cutting alloy casting with Arcair Torch. Tool functions in all positions. Self-aligning jets rotate with electrode to any angle.

Write for free brochure to Dept. MJ.

PUT AN *Arcair* TORCH TO WORK NOW!

LINCOLN ELECTRIC CO LTD · WELWYN GARDEN CITY · HERTS · WELWYN GARDEN 920

AAS



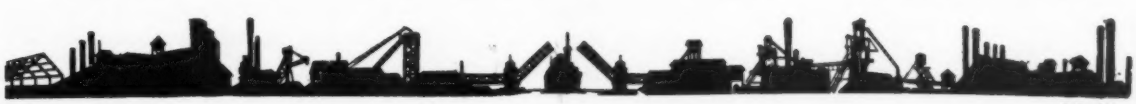
Stephen Humble's

SAFETY HOOK

We are the sole makers of these patent improved safety hooks. More than 10,000 of them are in use throughout the Mining world for the prevention of accidents by overwinding.

HEAD, WRIGHTSON & Co LTD

THORNABY-ON-TEES · STOCKTON-ON-TEES · LONDON · JOHANNESBURG



242—W

V2000 LASTS 8 TIMES LONGER THAN OTHER LUBRICANTS

This was the experience of a large brickworks, whose soft mud machine pinions have lasted 4 years and are still perfect since using VOLER COMPOUNDS; maximum pinion life was only 6 months with standard lubricants.

VOLER COMPOUNDS ARE THE MOST OUTSTANDING ADVANCE IN LUBRICATION AND PROTECTION OF OPEN GEARS ON HEAVY EQUIPMENT Users of heavy equipment know to their cost the ravages caused by continuous extreme pressure meshing, heat and exposure to grit, dust and corrosive atmospheres. Normal lubrication is costly and time-consuming, due to rapid break-down of film strength.

ENORMOUS FILM STRENGTH On heavy grades VOLER COMPOUNDS have a film strength equal to 80,000 p.s.i. (standard greases etc. rate 16,000/26,000 p.s.i.). This film strength is obtained with viscosities of less than ¼ that of normal compounds, i.e. maximum of 2000 Redwood Secs at 200°F. This naturally lower effective viscosity means reduced 'drag', higher efficiency with lower power losses.

WHAT ARE VOLER COMPOUNDS?

VOLER COMPOUNDS are an 'all lubricant' lubricant containing Superfine Graphite guaranteed free from abrasive matter and acknowledged to be one of the finest lubricants known. In addition VOLER COMPOUNDS include a unique non-corrosive and anti-corrosive element having 'Extreme Pressure' characteristics. No bituminous or similar carriers are employed.

THE SECRET OF GRAPHITE Take a new pack of cards, see how they slip, effortlessly, smoothly—that is how graphite works. It is composed of minute laminated flakes which, under working pressure, effect a lateral sliding movement one over the other. The result is an even, firm, level, non-lumping lubricating film.
Normally graphite does not adhere to metal, even in the usual greases, but the special additives in VOLER COMPOUND ensure a firm film, or graphite "skin", on the driving edges of the gear teeth—providing a safety margin against metal-to-metal contact.

'GEAR NOISE CUSHIONED OUT' The film imparted to gears, due to its cushioning effect is one of the prime reasons for the exceptional silence of gears when a VOLER COMPOUND is used.

VOLER COMPOUND PREVENTS GEAR DAMAGE VOLER COMPOUNDS are NON-DRYING and, because of the unique E.P. additives and Superfine Graphite used, the rate of oxidation is reduced to a minimum—this means NO LUMPING, NO CHANNELING and no broken teeth.

Dust and grit, common causes of drying out tending to build up and cause lumping and damage cause infinitely less trouble when VOLER COMPOUNDS are used. With VOLER COMPOUNDS dust and grit unavoidably absorbed by the fluid base are squeezed out over the greasy Graphoid film and are out of harm's way, the safety film remaining.
The firm graphite film formed with its small fluid content CAN ABSORB UP TO 40% IN WEIGHT OF FOREIGN MATTER before being affected as a lubricant.

VOLER COMPOUNDS WITHSTAND WATER VOLER COMPOUNDS are thoroughly water and moisture repellent. Under continuously wet conditions—even immersed in salt water—the lubricating value is unaffected.

SEE HOW YOU SAVE WITH VOLER COMPOUNDS

LESS DOWN TIME ON REPAIRS AND MAINTENANCE
Fewer fractures, less wear, less cleaning

LESS FREQUENT LUBRICATION
Applications once per week instead of every day, outside cranes once in 2 months instead of every 2 weeks
Tremendous savings in time and materials

LESS POWER AND HIGHER EFFICIENCY
Smooth, silent meshing with less 'drag' gives you more effective power

VOLER Compounds have been proved in use over 15 years

VOLER COMPOUND

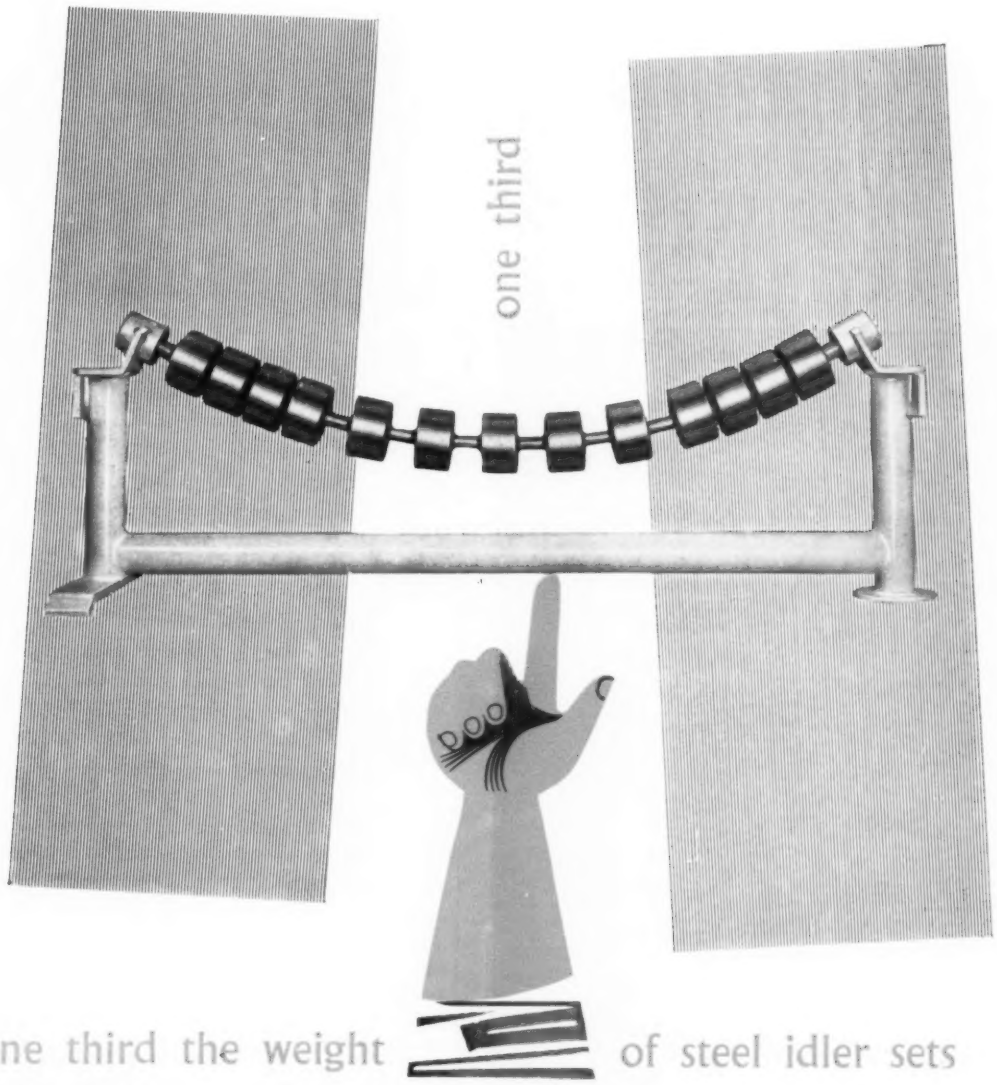
for exposed gears chain drives · wire ropes · cables

VOLER THREAD LUBRICANT prevents metal-to-metal seizure

VOLER DRYLUBE, the special graphite lubricant where cleanliness is essential

REVOL LIMITED *EXCHANGE BUILDINGS·QUAYSIDE·NEWCASTLE-UPON-TYNE·NEWCASTLE 22480*

P.3564



This revolutionary idler, which has proved itself in every American mining application, weighs only one third the weight of conventional steel idler. It is easily handled by one man and can be positioned under a moving belt carrying a full load. The Joy Limberoller idler* is now built in Britain by Joy-Sullivan Ltd. to belt widths of 24″, 30″ and 36″.

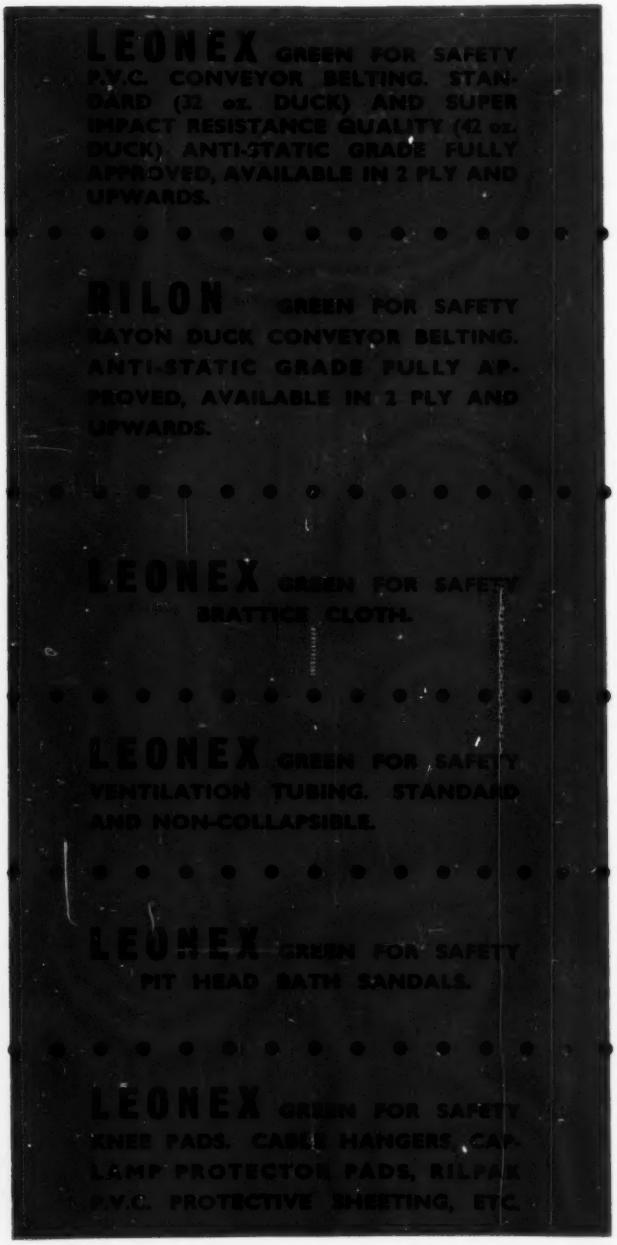
*The Joy Limberoller idler is a flexible belt conveyer idler that shapes itself to the load and uses only two bearings. It consists of a series of pressure-moulded neoprene discs moulded onto a neoprene sheathed, flexible steel cable. The use of neoprene and the self-cleaning action of the flexible cable effectively stops belt and idler wear. The two bearings are at each extremity of the cable, well clear of the dirt zone, and are sealed-for-life, thus needing no grease or maintenance.

JOY · SULLIVAN LTD

Please write to Joy-Sullivan Ltd., Cappielow, Greenock, Scotland for leaflet L118 which will give you the Limberoller's full story and details of its many applications. Export Enquiries to 6, Carlos Place, London W.1.

RIL Green for safety

PRODUCTS FOR THE MINING, QUARRYING AND ALLIED INDUSTRIES


LEONEX GREEN FOR SAFETY P.V.C. CONVEYOR BELTING. STANDARD (32 oz. DUCK) AND SUPER IMPACT RESISTANCE QUALITY (42 oz. DUCK) ANTI-STATIC GRADE FULLY APPROVED, AVAILABLE IN 2 PLY AND UPWARDS.
RILON GREEN FOR SAFETY RAYON DUCK CONVEYOR BELTING. ANTI-STATIC GRADE FULLY APPROVED, AVAILABLE IN 2 PLY AND UPWARDS.
LEONEX GREEN FOR SAFETY BRATTICE CLOTH.
LEONEX GREEN FOR SAFETY VENTILATION TUBING. STANDARD AND NON-COLLAPSIBLE.
LEONEX GREEN FOR SAFETY PIT HEAD BATH SANDALS.
LEONEX GREEN FOR SAFETY KNEE PADS, CABLE HANGERS, CAP-LAMP PROTECTOR PADS, RILPAX P.V.C. PROTECTIVE SHEETING, ETC.

Full N.C.B. approval and conforms to B.S.S. 490/1951 Specification for rubber belts. The *original* P.V.C. multiply flame proof belting. Over 4½ million feet in use by May 1956. Matt surface covers, giving maximum co-efficient of friction.

4-ply Rilon equals 6 plies of Standard 32 oz. Cotton Duck Belting. Less weight, more flexibility, lower installation, running and maintenance costs. Full N.C.B. approval, and conforms to B.S.S. 490/1951 Specification for Rubber Belts. Matt surface, giving maximum co-efficient of friction.

Non-inflammable, Anti-static, tougher and highly resistant to acidic water and abrasion. In use it has been shown to have up to five times the life of ordinary Brattice Cloth. Full N.C.B. approval.

Non-inflammable, Anti-static; passed N.C.B. flame-proof tests. Very tough, resists acidic attack and abrasion. The answer to all Ventilation problems.

Designed to offer protection against 'Athlete's Foot' inexpensively and efficiently. Non-absorbent sole and vamp.

A wide range of ancillary products including those mentioned, with the design accent on safety and efficiency, in keeping with the R.I.L. policy of "safety in the mines."

RUBBER IMPROVEMENT LTD.

RILEX WORKS, WELLINGBOROUGH, NORTHANTS. WELLINGBOROUGH 2218

The Mining Journal

London, December 7, 1956

In this issue . . .

Overtaxing Our Strength	687
Inco Raises Nickel Price	688
The Branigan Report	688
Russian Diamonds With a Pinch of English Salt	689
Ample U.K. Coal Stocks	689
Fifty Years of Mining in Peru	690
The Anderton Shearer Loader	691
The Effects of Radiation on Metals ...	693
Economic Geology in Uganda	694
Machinery and Equipment	695
Technical Briefs	696
Mining Miscellany	697
Metals and Minerals	698
London Metal and Ore Prices	700
Mining Finance	701
Company Meetings	705

Vol. 247 **No. 6329**

Established 1835

Joint Editors
U. Baliol Scott R. Bruce Duntield

News Editor A. G. Thomson
Financial Editor I. M. Moseley

Assistant Editor
R. Bowran

Display Advertisement Manager
E. S. Hooper

Circulation
Robert Budd

Published each Friday by
THE MINING JOURNAL LTD.

Directors
E. Baliol Scott *(Chairman)* U. Baliol Scott *(Managing)*
G. A. Baliol Scott R. A. Ellefsen

15, WILSON STREET, LONDON, E.C.2.

Telegraphic Tutwork London
Telephone MONarch 2567 (3 lines)

Annual Subscription £2 5s. Single copy ninepence

Overtaxing Our Strength

PETROL rationing, huge gold and dollar losses, and sharp fluctuations in commodity prices, tell too clearly the initial consequences of the Suez débâcle. Now, rumours of increasing income tax, higher prices, and efforts to secure the vital dollars from the World Bank to keep the economy on an even keel over the next few months completes the melancholy picture. To the mining industry, however, the emergency decisions now taken tell another story : that budgetary and balance of payments positions may fall below the Chancellor's expectations thereby jeopardizing anticipated legislation concerned with introducing reliefs for " overseas trade corporations " and " pioneer industries ".

It will be recalled that the Chancellor in June last gave an assurance that if budgetary and the balance of payments considerations permitted, he would consider whether he could introduce legislation in 1957 to give reliefs for " overseas trade corporations ". Further, he promised that if he was not able to introduce reliefs for " overseas trade corporations ", he would bring forward legislation retrospective to April 6, 1956, to deal with the problem of the frustration by the U.K. tax system of " pioneer industry relief " given by overseas governments. In his speech the Chancellor referred to the " overseas trade corporation " relief as a major measure and the granting of reciprocal relief for " pioneer industry relief " as a minor one.

While the precise extent of either measure must await consideration of the actual legislation, it is essential to Britain's future —whatever may be the budgetary and balance of payments positions—that these reliefs be implemented as soon as possible. Already the lack of any conscious national policy on mineral resources has cost this country dearly. Successful takeover bids for several U.K.-controlled overseas mining companies has lost us control over valuable sources of raw materials. Oil in Trinidad, tin and columbite in Nigeria, and base metals in various parts of Southern Africa are some of the more recent examples where strategic minerals have been wrenched from our grasp by U.S. interests who clearly understand that whatever the requirements may be in the short-term, the long-term future demands vastly increased supplies of virtually every known mineral.

It would be wrong to declare that an essential pre-requisite for the establishment of a national mineral resources policy is that our tax codes must, at the very least, provide as much in the way of incentives as are granted by other governments. At the same time without the provision of an equitable tax basis, no mineral resources policy however formulated can possibly function to the advantage of this country.

The heart of the matter is, of course, the sheer weight of the tax burden borne by U.K. mining companies in relation to their overseas competitors who are able to take advantage of their own tax codes which are deliberately devised to set aside as tax-exempt part of their profits to encourage and stimulate them to open up and develop new prospects. The indifference shown to our poor competitive position in this regard by successive British governments has already resulted in the passing beyond this country's control of vitally important sources of mineral resources.

In the months ahead the British Overseas Mining Association will be framing its proposals to the Chancellor which, in total, will have the express object of placing this country's overseas mining interests on an equal footing with their overseas competitors.

Considerable store has been placed in the Chancellor's acceptance of reliefs for "overseas trade corporations" and the Association will argue for a wide definition rather than a narrow one. But, presumably, the general criterion will be granting of tax relief to U.K. controlled companies whose entire source of income arises from overseas.

The Chancellor in stating that relief to "overseas trade corporations" would be a major measure is, of course, thinking purely in terms of revenue to the Exchequer but the granting of reciprocal relief for "pioneer industry reliefs", referred to as a minor measure, could very well prove to be the more beneficial of the two to the British overseas mining industry. This is so because changes in this direction would provide the incentive and inducement for companies to develop new properties if, as is envisaged, tax-free holidays of a reasonable duration, together with depletion allowances and the rationalization of the present system of double tax reliefs, were granted. If these points were conceded, together with the concession that the profits of overseas mining companies controlled from the U.K. be taxed only to the extent that they are remitted to this country, not only would the companies cease to kick against the notorious section 36 of the 1951 Finance Act forbidding companies to emigrate without Treasury permission, but our control over strategic raw materials resources would be immeasurably strengthened.

At this point it ought to be said, perhaps, that too much has been made of the fact that no new mining companies have registered in this country since before the last war. However ominous this appears at first sight as a function of the swingeing burden of taxation, the truth of the matter is that political advancement in almost every country in the world had made it imperative that companies established overseas become an integral part of that community and help to finance its continued development.

Yet this is not incompatible with any clear-highted national mineral policy as those familiar with American techniques will readily agree. What it does mean is that the day is gone forever when U.K.-financed mining companies operating overseas can be ruthlessly exploited by the Chancellor of the Exchequer at the expense of the overseas country concerned in whose territory and with whose labour valuable minerals are being secured for the benefit of the United Kingdom.

INCO RAISES NICKEL PRICE

With effect from to-day the International Nickel Co., through the Mond Nickel Co., has raised the U.K. nickel price to £600 per ton from the previous level of £519 at which it has stood at some two years. Inco has long followed the twin policies of maximum possible price stability coupled with keeping the price of nickel as low as possible in the interest of developing use. This latter policy may sound a little peculiar in these days when the consumer is paying £2,000 a ton or more for secondary metal—if he can get it, but this is a relatively short-term situation in the history of an organization like Inco which has always taken the long view.

In the foregoing context two things can be said about the price increase. First it should be sufficiently substantial to ensure a further longish period of unchanged prices. Secondly, so much has already been done in the way of substitution through sheer non-availability of nickel that a mere 16 per cent price rise is unlikely to make much difference. Especially is this so since it is clear that the condition of shortage may be prolonged for some years yet, as was indicated by the recent invitation from the O.D.M. in Washington to companies both inside and outside the States to plan for new and expanded nickel production facilities.

That Inco will not be slow in taking up this challenge is proved by announcement yesterday from Winnipeg (issued jointly by the Premier of Manitoba and Inco's President) of plans for the development over the next three or four years of a $175,000,000 nickel project in the Mystery-Moak Lakes area in Northern Manitoba involving the establishment of two new mines at a cost of over $100,000,000. It would seem a reasonable inference that to-day's nickel price increase is linked to the financing of this large project which will also involve Inco in a $20,000,000 loan to the Province for the part-financing of a large power plant at Grand Rapid on the Nelson River. This will supply the power requirements of two new mines which will be about 400 miles north of Winnipeg. These two mines, together with expansion already underway at Sudbury, will lift Inco's nickel productive capacity (which in 1955 was around 130,000 s.tons) to an eventual figure of some 190,000 s.tons. Inco's current capacity of 130,000 s.tons is at present being boosted by the production of a further twelve thousands short tons of Washington price-supported production from submarginal ore, and the foregoing estimate of eventual production, which will presumably be reached some time in the early 1960's, pre-supposes that production from submarginal sources will have ceased by then.

Inco estimate that as a result of this new project, world nickel production would by 1960 be in the region of 300,000 s.tons.

THE BRANIGAN REPORT

The Branigan Commission of Inquiry into the mid-summer unrest on the Copperbelt (which published its report last week) had two main tasks: to inquire into the causes and circumstances of the unrest; to decide what could be done to avoid its recurrence.

The Commission had no difficulty in providing an answer to their first question: ". . . we have reached the conclusion that the cause of the unrest . . . was the irresponsible opposition of the Northern Rhodesia African Mineworkers' Trade Union to the Mining Companies' recognition of the Mines' African Staff Association as an organization representing certain categories of the Companies' African employees.

The circumstances of the Companies' recognition agreement with the African Union of October 11, 1955, has all along been the nub of the whole affair. It is quite clear that on that day the leaders of the African Union did, in fact, put their pens to an agreement that laid down (in appendix 4 of the report) a schedule of categories of African employees to be covered by the union. It is still open, of course, for the African Union to argue that this agreement was made under the threat of notice of termination of agreement; but then all collective bargains are exercises in the use of power. However, there is no doubt that from October 11 the Union was committed both to the acceptance of an African Staff Association and to the schedule of jobs it should cover. The Union will now have to accept the Association and learn to work with it.

The Commission has a number of useful recommendations on what should be done to improve labour relations on the Copperbelt. It recommends that the criteria used in

effecting classification of supervisory and staff categories should be embodied in the existing agreements between the Companies and the African Mineworkers' Union, and the African Staff Association. This should certainly help to prevent misunderstanding, but the Commission might perhaps have gone further and recommended the establishment of a specific procedure for consultation and arbitration on this matter for the borderline cases are likely to be frequent, and feeling on them may again run high.

Secondly, the Commission recommends the introduction of Shop Stewards, as suggested by the Companies and approved of the Acting Labour Commissioner. (We hope they will be given some suitable training!)

Thirdly, the Commission recommends that the number of paid officials in the African Mineworkers' Union be reduced because it is excessive. This, however, is only a recommendation and the Commission categorically rejects the Companies' request that the number of paid officials be limited by law. In this connection it is noteworthy that the Commission found no direct evidence of interference in the Union's affairs by the African National Congress as such.

Fourthly, the Commission, impressed by the work of Labour Officers, recommends that the Government should consider appointing two experienced Labour Officers at each of the four mining centres.

Fifthly, the Commission is not wholly satisfied with the work of the African Personnel Departments. "We have gained the impression that despite the endeavours of the African Personnel Departments there may have been, on occasions, a failure to recognize the depth of feelings which certain matters in disputes had engendered, not only in Union leaders but amongst the rank and file of the African employees. We recommend that the Companies should keep under constant review the recruitment and training of the Staff of their departments." This is a crucial—and one of the most promising—recommendations.

Sixthly, the Commission recommends that the finances of the African Union be inspected regularly and—this is another very constructive offering—that the Government instruct union officials in the proper keeping of accounts.

The seventh and last recommendation seems more questionable. It recommends that Section 29 of the Trade Unions and Trade Disputes Ordinances be amended so as to make causing ridicule "by jeers and jibes" an offence. Even if lawyers could be found to define "jeers" and "jibes" no African could understand this definition. The recommendation seems rather pompous, and is sure to lead to confusion and possibly to victimization.

It has been said many times in these columns, and the Commission reiterates the point, that the Copperbelt companies are unsurpassed as enlightened mining employers. The welfare of all races and indeed, of the Federation, depend on their efforts and they are fully alert to their responsibilities. But it also emerges from the Commission's report that the Companies may not have been as well served as they might have been by their labour advisers, and the Commission undoubtedly comes near to the heart of the matter in its insistence on a bigger and better African Personnel Department, more Labour Officers and an African Union that derives its strength partly from being truly representative and partly from having a steady upward flow of officials trained in the work of shop stewards. The African Mineworkers' Union has been the villain of the piece; but it needs to be reformed not shackled.

Now that the Commission has made its report, it is to be hoped that the government's attitude will soon be announced so that a clear cut basis can be established on which the process of reformation can begin. The longer the Northern Rhodesian government feels constrained to continue the State of Emergency and the restriction on movement of the Mineworkers' Union officials arrested on September 12, the slower and more painful is likely to be the Union's rehabilitation.

RUSSIAN DIAMONDS WITH A PINCH OF ENGLISH SALT

That large diamond deposits have been discovered in Yakutsk, north-east Siberia, has been the subject of a Reuter message this week. Reserves, estimated at hundreds of millions of carats, are purported to be equal in size to those of Africa and Brazil. This same story, with embellishments, was published all over Russia in March of this year, when it was also indicated that the Soviet would enter the world diamond market.

Why, it must be asked, should the story be repeated? The West got it straight the first time, as did the market. Since the deposits are alluvial, were discovered in 1954, and have yielded five times as many diamonds as is produced by the entire Soviet diamond industry in a year, it is incredible that Russia has not been in the world market already. If, of course, the deposits are as large as stated, their value to Russia for industrial purposes and as a foreign exchange earner cannot be underestimated. Nor, indeed, can its possible impact on the world diamond market. Meanwhile, it will be interesting to see if the black market for diamonds in Europe and in Africa now begins to dry up.

AMPLE U.K. COAL STOCKS

To bridge the fuel oil gap caused by the blocking of the Suez Canal the European Coal and Steel Community will need an additional 6,000,000 tons of coal next year, according to recently announced estimates. At the moment, however, pit head stocks of coal both in the Community and the U.K. are fairly healthy — almost 7,000,000 tone in the Pool countries and 23,000,000 tons distributed stocks in Britain. So far this year coal output in the Community is some 3,500,000 tons above last year's figure and for the first ten months of the year was almost 208,000,000 tons. The major share of the increased output, results from boosted German productivity. Although Britain's total output is also up on last year, it is only a meagre 400,000 tons, and that by virtue of expanded open cast mining operations.

Stocks in hand in Britain are ample for the time being, and as there appears to be little scope for a short-term switch over from oil to coal, it does not seem likely that a solid fuel shortage will be manifested at least, for some time to come. The lag in deep mined production is particularly disappointing, in view of the heavy expenditure on power loading machinery, and is more inexplicable considering that industrial disputes are costing much less lost output than in previous years.

The Suez crisis will, however, have considerably strengthened the hand of the N.C.B. in resisting the mineworkers' union in their claim to abolish the "attendance bonus shift". (See "M.J." November 2, 1956). The time is certainly not propitious for any gamble which may result in lessening an already insufficient indigenous output, for it must be borne in mind, that whilst current stocks are high this is only because of considerable U.S. coal imports.

Fifty Years Of Mining In Peru

THIS year one well-known British undertaking, the Lampa Mining Co. Ltd., celebrates the completion of half a century of silver and copper production in Peru, having been floated as a limited liability company in 1906.

The principal objects of the company were stated in the Memorandum of Association to include taking over the mines "Santa Catalina," "San Otto," "San Carlos and Socavon," "Esmeralda" and "Rubi," the use of the site known as "Trapiche," and the water power of "Toropujani"—all in the neighbourooh of Santa Lucia in Southern Peru. The Grundy properties including the Berenguela Mine, which is now the company's mainstay, were taken over in 1913.

Santa Lucia is a small railway town on the Southern Railway of Peru on the line from Arequipa to Puno. It is situated in the Province of Lampa, from which the company derives its name.

The mining properties in Peru were acquired for a payment of £5,500 in cash and £11,000 in fully paid-up shares. In the prospectus output was estimated to be at the rate of 1,000 tons annually of copper ore containing 30 per cent copper and 20 oz. per ton of silver, plus an additional "low grade" ore assaying 12 per cent copper and estimated to be produced at the rate of 10,000 tons per annum. In the prospectus the nett profits were estimated at £9,500 per annum. The price of copper in those days was around £80 a ton.

Long Road to Success

Losses were incurred in each of the first five years, and 1915 brought a further loss of £2,937, but was notable for the first shipments of matte from smelting operations.

Nevertheless, the price of silver was moving in the company's favour, and the first indications of prosperity appeared in the balance sheet at June 30, 1917. Turnover had reached £39,761 and the profit on the year's working amounted to £7,696. Debentures had all been redeemed or converted and the issued capital amounted to £70,000, as it does to-day. It was not, however, until November, 1920—14 years after its foundation—that the company was able to declare its maiden dividend of 10 per cent.

After a period of fluctuations in which dividends were often passed, the company was badly hit by the slump years from 1930 onwards and the mine was very nearly closed down entirely. In 1934, when its fortunes were at their lowest ebb, Mr. F. H. Sharpe assumed the management. With Mr. F. C. Pollandt as mine superintendent, a vigorous development of the Berenguela Mine was undertaken. This brought to light considerable shoots of rich ore, which were mined and exported. It was about this time, 1935, that the present chairman, Mr. J. Shirley Esplen, and the present managing director, Mr. E. Senior Smith, joined the board.

By exporting rich silver ores, the company was able to resume dividend payments and to restore its financial position. Since then, although fortunes have fluctuated, there has never been a year in which some payment to shareholders has not been made.

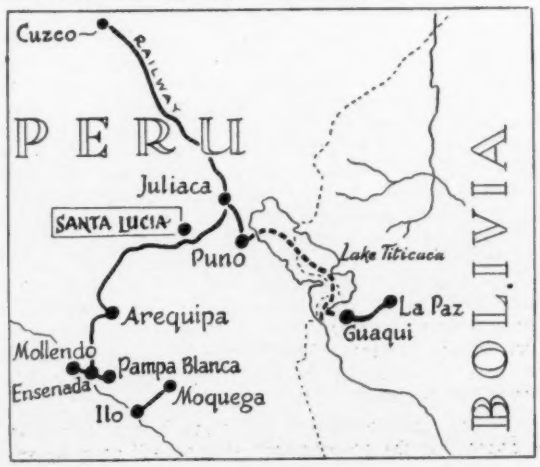
During the second world war the rich ore became exhausted and the grade fell to a point where it could no longer be exported at a profit. In the hope of being able to mine and treat ores below the export grade, experiments were made with an oil-field reverberatory furnace. After considerable teething troubles the pilot furnace began to show results. A larger scale reverberatory furnace was then constructed and when this had proved itself in practice a second one was constructed in place of the original pilot furnace. In this way it was possible to have one furnace in operation while the other was being repaired and relined. To obtain a successful flux with the highly oxidized and refractory Berenguela ores, it was necessary to operate other mines at some distance to supply pyrites, chalco-pyrites and silicious copper ores. All this required a considerable expansion of operations. In May, 1953, both furnaces were operated for one month simultaneously and production of matte soared that month from 80 tons to 152 tons.

Since then efforts have been concentrated mainly in two directions: (1) to increase the smelter output and so contend with the continually rising costs of labour and materials: and (2) to develop an alternative process for treating the refractory Berenguela ores which, it is hoped, may prove a more economical and efficient method of extraction than by smelting.

It was decided to expand smelter production by constructing a third reverberatory furnace, thus allowing two furnaces to work continuously with one held in reserve. The third furnace was blown in at the beginning of March, 1956. In order to achieve the second aim a trial plant was erected at the mines in 1954. It remains to be seen whether this plant will prove successful.

It has always been the policy of the company to reinvest in Peru a reasonable proportion of the profits, not only in such directions as new machinery and equipment, but also in providing improved living conditions and better amenities for employees.

The policy of the board is to maintain and increase the degree of liaison and contact between the registered office at Liverpool and the mines. At one time the question of transferring the company's domicile to Peru was very closely considered, and this is a course of action which circumstances might still dictate.



MECHANICAL CUTTING AND LOADING IN COLLIERIES—VIII

The Anderton Shearer Loader

Eighty-three Anderton Shearer Loaders were in operation in British collieries during 1955 and, working in seams ranging from 3 ft. 6in. to 7 ft. 0 in. thickness, produced 3,361,600 tons of coal. Over the first quarter of the year the average O.M.S. obtained on 35 projects was 5.96 tons. A further 200 machines are expected to be received by the N.C.B. this year. The following article, the eighth of a series, describes the Anderton Shearer Loader.

DEVELOPED in the St. Helen's area, North-Western Division, N.C.B., the first Anderton Shearer Loader was put into service in the Rushy Park seam at Ravenhead in 1952 and by June, 1955, 19 were at work. Some idea of the variety of conditions under which operations can be successfully carried on may be gained from results in this area, where 13 collieries worked in 1955. Seam thicknesses vary from 3 ft. 6 in. to 7 ft. 0 in. and face lengths from 145 to 260 yds., with an optimum length of 200 yds. With faces advancing on the strike the dip on the face line averages 1 in 5½. Faces advancing to the rise at an average gradient of 1 in 5½ are worked as also one face advancing to the dip at 1 in. in 12.

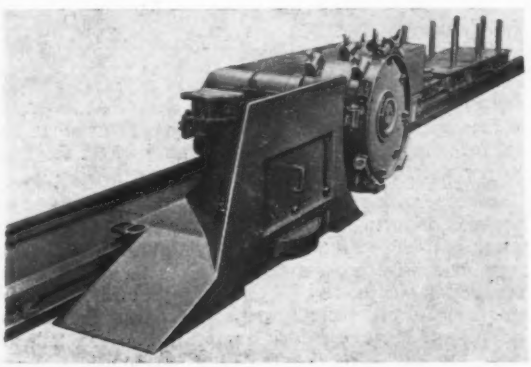
By J. M. CAW

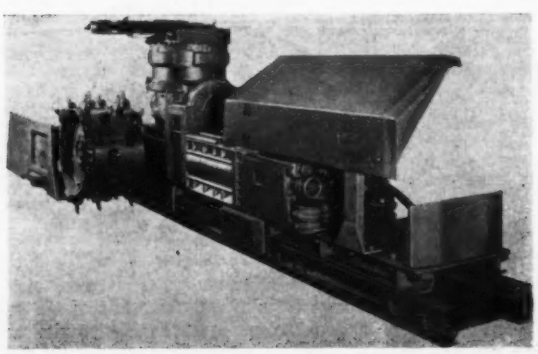
The principle of the machine evolved utilized a conventional coal cutter in which the jib was replaced by a revolving drum with picks mounted on the periphery. Several companies produce shearer loaders with specially designed shearing units, etc. Measurements and speeds below refer generally to B.J.D. machines.

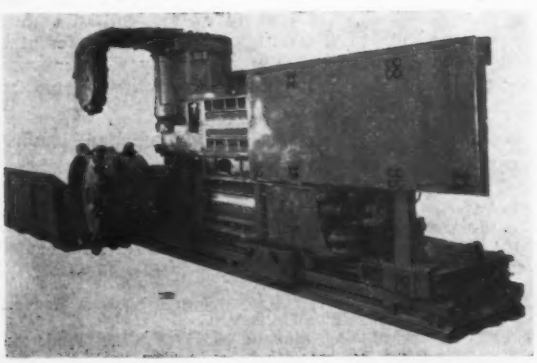
The drum carrying steel pickholders is mounted on a horizontal shaft which projects towards the face approximately at right-angles to the machine. This is rotated by a 75 h.p. electric motor which also powers the haulage unit. Behind the drum is mounted a fabricated steel plough shaped to turn coal on to the conveyor as the machine advances along the face and to deflect any coal in the path of the plough over it and on to the conveyor when flitting back. These main units are mounted on an underframe which is usually arranged to give 6 in. clearance above the chain of the armoured conveyor so that small lumps of coal can pass satisfactorily beneath the shearer loader if necessary. On face and goaf sides are two bearing plates which keep the machine in alignment on the conveyor. The main length, breadth, height dimensions are 17 x 2-3 x 3-0 respectively, with a weight of 5 tons. The height is, of course, variable with the drum diameter.

The drum unit is made in several sizes to give various cutting depths (normally 16-22 in.) and in diameters between 32 and 54 in. so that the hardness of any seam can be suited. Tungsten carbide tipped picks are mounted in the pickholders around the periphery of the drum, the latter usually being arranged to hold the picks at right-angles to the drum surface, except for the outer row which are set at an angle to give cutting clearance. Water sprays are provided on the drum and at the plough. The haulage unit is designed to work as an automatic feed and safety device whenever a predetermined rope pull is exceeded. A complete obstruction will stop the machine without damage. The speed range is variable in three steps and gives the following shearing and ploughing speeds:

Shearing speeds	*Ploughing speeds*
21, 42, 63 in. per min.	30 ft. per min.
27,54,81 in. per min.	39 ft. per min.
34,68,102 in. per min.	49 ft. per min.







(Top right): The B.J.D. Anderton Shearer Loader; (Below right): The same machine with an additional 75 h.p. motor driving the top jib; (Below): the unit with ranging head for thick seams

The thinnest seam yet worked by this machine is about 3 ft.[17] The lower limit of thickness is imposed by the dimensions of the loader, the conveyor, and the space which must be left between them to enable coal from the stable holes to pass underneath the loader while it is travelling on the conveyor at the face. If stable hole work during the cutting shift can be avoided it may be possible to reduce this lower limit by a further 6 in. and experiments in this connection are in progress. There is no upper limit to the seam thickness which can be worked with this machine, but if coal left uncut does not fall under its own weight time will be wasted in getting it down.

Any length of face may be worked by the Anderton Shearer but the armoured conveyor will impose limitations of between 200 and 300 yds., depending upon the gradient. The gradient at which the armoured conveyor can work probably also determines that for the machine. Burton and Rudge[9] describe work carried out at Denaby Main Colliery on the D5 face 723 yds. below surface in the Parkgate seam using an Anderton disc shearer loader similar to that detailed above in 1954. Under normal conditions the seam thickness lies between 4 ft. 2 in. and 4 ft. 5 in. but exceptionally increases to 5 ft. 6 in. In general the seam parts readily from floor and roof. With an on-bord face length of 114 yds., excluding a 10 yds. stable hole at each end of the face, it was expected that cutting would take 38 min. and the return journey 19 min. and that a complete 18 in. cut and load would therefore take one hour. This goal was rapidly realized using a team of 11 men, with four strips being done in each shift. The results obtained at this stage are:

Week Ending	*Tons*	*Machine Team*		*Total Face*	
		Shifts	*O.M.S.*	*Shifts*	*O.M.S.*
9.1.54 ..	1,725	73	23.7	260	6.6
16.1.54 ..	1,705	55	31.0	188	9.1
23.1.54 ..	2,027	70	29.0	260	7.8
30.1.54 ..	2,178	68	32.0	256	8.5

Difficulties encountered included easing of the coal after the cutting run which caused jamming of the drum on the return journey. This was successfully overcome by running the discs whilst ploughing.

The face was now advancing at 6 ft. per shift and the output had increased by 500 tons per week. At this stage the face lengths was extended and it was found that 150 yds., including stables, was the maximum length for four cuts per shift.

Further lengthening of the face required the addition of a tail-end drive to the conveyor. The work of cleaning spillage coal behind the plough, moving the conveyor and the tail-end drive became too much for three cuts to be completed in one shift by the time a length of 213 yds. had been reached. A plough was made to fit behind the machine and compressed air rams fitted at the tail-end drive. It was concluded that with hydraulic rams installed throughout the face a good plough should enable 10 men to strip a 200 yds. face three times in a 5½ hr. shift. The elimination of peak loading by mechanized cutting and loading through the shift was stated to represent a great advantage in that the trunk conveyor system was able to carry almost double the tonnage that could be obtained from hand-filling.

In common with most other cutting and loading machines design and development has proceeded steadily and two of the more recent variations of this machine for use in wide seams, or particularly hard coal that requires a positive cutting action at roof level, are briefly described below.

The Anderton Shearer Loader with ranging head has a jib, driven from the shearer unit, mounted on a turret which can be raised or lowered by hydraulic jacks enclosed within it. The adjustment of turret height can be made with the jib in the cut as the machine traverses the face whilst cutting, power for this being supplied by a piston pump fitted in the haulage unit. The jib drive can be disconnected by a clutch and means of changing the direction of the chain driving sprocket is provided. Water sprays are provided to the top cutting unit and steel guard plates give protection for the driver against falling top coal. The table shows the range of heights available for a machine fitted with a mechanical unit.

Turret	*32½″ drum*	*40″ drum*	*50″ drum*
Mark 1 ..	4′ 7½″ to 4′ 11½″	4′ 11½″ to 5′ 3½″	5′ 4½″ to 5′ 8½″
Mark 2 ..	4′ 10½″ to 5′ 5½″	5′ 2½″ to 5′ 9½″	5′ 7½″ to 6′ 2½″
Mark 3 ..	5′ 2½″ to 6′ 0½″	5′ 6½″ to 6′ 4½″	5′ 11½″ to 6′ 9½″
Mark 4 ..	5′ 8½″ to 6′ 11½″	6′ 0½″ to 7′ 3½″	

The cost of equipping a face for mechanized operation is illustrated by tables given by Round and Scott[12] for the top hard seam of Gedling Colliery, No. 6 Area, East Midlands Division.

Comparative costs for depreciation and interest were as follows:

	Anderton disc-shearer	*Conventional longwall*
	£	£
Capital expenditure	20,255	10,873
Major revenue expenditure ..	16,818	4,542
Total	37,073	15,415
Depreciation at 12½%	4,634	1,927
Interest at 5%	1,854	770
Total	6,488	2,697
Tons per day	490	240
Cost per ton	1s. 1.0d.	.... 11.0d.

The machine is being worked on a two shift per day basis, as a continuous-mining project with 30 men on each getting shift and 13 men on the ripping shift. Comparative details of productivity between two similar faces are given as:

	140's Unit		*130's Shearer loader unit*
	Hand-loaded	*Meco-Moore*	
Average working section	3 ft. 7 in.*	4 ft. 5 in.	4 ft. 6 in.
Section of clean coal ..	3 ft. 4 in.	4 ft. 1½ in.	4 ft. 1 in.
Face length	166 yards	164 yards	240 yards
Average daily tonnage ..	237	279	477
Face productivity (saleable) cwts./manshift ..	81.6	100.7	122.4
Tons produced/yard of face/24 hours	1.43	1.70	2.00
Face labour cost ..	14s. 4.7d.	11s. 10.4d.	10s. 1.9d.
Face materials cost			
Timber	1s. 4.5d.	9.4d.	7.4d.
Steel	11.1d.	3.2d.	5.3d.
Explosives	5.2d.	3.7d.	1.7d.
Other	4.0d.	7.1d.	5.3d.
Cost per ton	3s. 0.8d.	1s. 11.4d.	1s. 7.7d.

Period of comparison.. 8 consecutive weeks in all cases.
* 10 in. of conny coal left to form a roof.

Sizing of the product is affected by drum dia., pick speed and speed of forward travel. Pick speeds of 680 to 820 ft. per min. appear to give reasonable results at Gedling.

REFERENCES

(8) Anderton, J. Anderton Shearer Loader. N.C.B. Mechanization Conference, July, 1955.
(9) Burton, J., and Rudge, C. Progressive Development of Power Loading at Denaby Main Colliery. Trans. I.M.E., Vol. 114, Pt. 8. May, 1955.
(12) Round, C., and Scott, R. Anderton Shearer Loader. Experience at Gelding Colliery.
(17) N.C.B. Information Bulletin 54/129. The Anderton Shearer Loader.

The Effects of Radiation On Metals

Radiation effects on metals are of obvious importance to designers of nuclear plant. They will also be a critical factor in space travel and in the design of aircraft for higher supersonic speeds. The changed properties resulting from irradiation are leading to the development of new materials for industrial needs. This article is based on papers presented at a Symposium held in Cleveland, Ohio, on October 8, 1956, under the auspices of the Institute of Metals Division, American Institute of Mining, Metallurgical and Petroleum Engineers.

THERE are two important reasons for the present interest in the effects of radiation on solids. On the one hand, irradiation introduces defects whose study extends our basic understanding of solids and tests this understanding in important ways. On the other hand, irradiation alters the physical and chemical properties of materials, sometimes drastically, and must always be reckoned with in the design of nuclear reactors and associated equipment. Although a complete and satisfactory understanding of all effects cannot yet be claimed, we can account in a qualitative way for many of the phenomena, and have achieved quantitative understanding in some of the simpler cases. The study of radiation damage is essentially a study of defects in solids.

A large number of the radiation damage studies have been made with nuclear reactors. Here the radiation is a mixture of fast and slow neutrons, gamma rays, and beta rays. The most important damage effects arise from the fast neutron component, although the gamma rays are also quite significant. Radiation damage can also be produced by gamma rays from activated sources, by X-rays, and by fast charged particles (electrons, protons, deuterons, etc.) from accelerators.

Every physical property of a solid is altered to some degree by irradiation, primarily by introducing defects into the periodic lattice. Defects produced by irradiation influence the electrical resistivity, stored energy, and slow neutron transmissivity of solid materials. Essentially, every physical property of a solid is affected by irradiation.

The mechanical effects of irradiation of metals are generally an increased hardness, brittleness and yield strength. There is also an increase in elastic modulus and a reduction of internal friction. The plastic effects can be qualitatively understood on the basis that the point defects produced by irradiation obstruct the motion of dislocations through the lattice ; in many respects an effect similar to that of alloying. Calculations have shown that the elastic moduli of close packed metals should be raised by bombardment.

Nuclear Requirements

In nuclear applications the thermal neutron absorbing characteristics of a potential material are of paramount importance. This factor arises because an operating reactor must exercise a rigid neutron economy if it is to be economical to construct and to operate. Neutrons that are absorbed by the non-fissile components of a reactor are not available for producing fission in uranium atoms, so we must choose materials that have low absorption cross sections. It is further desirable not only that the residual radio-activity induced in the various components of a reactor be of low intensity, but also that the half life should be of short duration, so that maintenance may readily be carried on during reactor shut down. Furthermore, the energy of the radiation that does persist should be as low as possible further to reduce the need for shielding. For example, cobalt is always considered an unwelcome member of the reactor community. It has a large cross section, a long half life, and a very energetic gamma ray.

On the other hand, if we are interested in forming a barrier to neutrons and other energetic radiation such as gamma rays, then we shall in the first case choose materials with a large cross section such as boron or cadmium and in the second case, materials of high atomic number and density in order to attenuate the gamma rays more rapidly.

If we are interested in materials suitable for moderators (those materials whose function it is to slow down to thermal energies the fast neutrons born in the fission process), then we will choose materials with low atomic number, since the closer to the mass of the neutron is the material, the greater the fraction of momentum which can be transferred from the neutron per elastic collision and, therefore, the fewer the number of collisions required and the less the volume of material necessary. But again, in order to preserve the maximum number of thermal neutrons for fission process, moderator materials must not have large absorption cross sections.

These requirements are complicated by one further important problem — that of radiation stability — for, if the material cannot maintain its structural integrity in a reactor radiation environment, it will prejudice the safety of the reactor and hence we dare not use it.

The Problem of Uranium

The first place to look for neutron irradiation effects in a reactor material is in the fuel, which for most reactors is uranium. Under intense neutron irradiation metallic uranium becomes hard and brittle, it swells and elongates, it loses electrical and thermal conductivity. That it does all these things is a strong function of the original nature of the metal. Uranium's normal properties are so contrary that, if we had a free choice in the matter, it is the last material we should choose for reactor applications.

The gross properties exhibited by uranium under irradiation pose many serious problems in reactor design. It may be that completely satisfactory solutions will never be available. There are a number of ways, however, to achieve a compromise. One of the most successful devices used thus far has been the utilization of alloys of uranium with various non-fissile metals. A number of alloys have been studied such as beryllium-uranium, aluminium-uranium and zirconium-uranium. An alloy of beryllium-20 per cent uranium showed no changes in thermal conductivity during an in-pile measurement at 100 deg. C. Zirconium base alloys have also shown excellent radiation stability, with maximum density changes not exceeding 1 per cent after very extensive bombardment.

Radiation studies have been most extensively reported for the aluminium-uranium alloys containing up to 30 per cent uranium. Substantial increases in hardness and strength have been observed, as well as corresponding reductions in ductility. Significant decreases in electrical and thermal conductivity were also reported. However, the dimensional stability

in all cases was uniformly good. Though aluminium is an excellent metal for reactor applications, it is possible that for extreme bombardment conditions and in the presence of an unfavourable microstructure the material might eventually exhibit severe radiation damage. The degree of dispersion of the uranium in the aluminium can have an important influence on damage to the aluminium.

It has been reported that a 10 per cent molybdenum alloy when in the metastable gamma stage will tend to remain stable under irradiation. Furthermore, if this alloy is decomposed, then irradiated, a transition back to the gamma phase is observed.

Moderator Materials

The severe nuclear restraints placed on materials for moderators have limited the number of metals that can be considered for this purpose. Beryllium is the only metal to meet requirements of low neutron absorption cross section, high scattering cross section and a low atomic number to the extent that it has been used in operating nuclear reactors. This metal has exhibited exceptionally good radiation stability. Moderate neutron bombardment has led only to negligible changes in crystal structure, density and mechanical properties. Beryllium oxide has been considered on many occasions as a potential moderator, but serious losses in thermal conductivity and susceptibility to shock upon irradiation have forestalled wide usage in preference to beryllium. Cost and fabrication problems prevent it from competing with graphite.

In reactors where requirements of rapid neutron energy attenuation are not severe, materials such as aluminium, magnesium and zirconium might be of interest, since their irradiation stability is good.

Graphite is the most widely used material for moderators. As with uranium, however, the pronounced anisotropy in its crystal structure leads to severe irradiation effects. Large changes have been observed in thermal and electrical conductivity, lattice constants, dimensions and Young's modulus. Certain mechanical properties such as compressive strength show pronounced increases. The material becomes harder and the machineability declines rapidly. In spite of the severe radiation effects, graphite still remains a popular material because it is cheap, readily available, easy to fabricate, and can be used as a moderator and as a structural component.

Structural Materials

Next to uranium and graphite, the structural materials that are of potential use in a reactor have received the most attention. Research is very active in this area and covers many of the conventional materials of construction. Mechanical properties are of the most interest, but other properties such as the electrical conductivity have been studied in some detail.

The impact strength of the carbon steels has received much attention, since it has been observed that this property is quickly lowered and at the same time the transition temperature for brittle to ductile fracture is increased after room temperature bombardment. The large changes in impact strength in the low carbon steels will pose specification problems. A loss in impact strength can be found in other metals than iron. For instance, grave losses in the ductility of molybdenum have been observed. It is expected that any metal or alloy that is predisposed to exhibit brittleness in the absence of irradiation will probably have this weakness enhanced under irradiation.

The papers presented at the Symposium under review have been published as *Nuclear Metallurgy* (*Vol. III*), IMD Special Report Series No. 3. This publication is obtainable from the American Institute of Mining, Metallurgical and Petroleum Engineers, 29 West 39th St., New York 18, N.Y. Price $3.75.

Economic Geology in Uganda

Increased activities in mapping and surveying are recorded in the annual report for 1955 of the Geological Survey of Uganda, which last year became one of a group of Natural Resources departments responsible to the Minister of Natural Resources.

In 1955 an average of nine geological field parties mapped a total area of 5,250 sq. miles, an increase of 28 per cent over that covered in the previous year. In the field of economic geology detailed surveys of the underground and surface geology of mines in Kigezi and Ankole and mineralogical and geophysical investigations of the ore-bodies associated with the alkaline complexes of Bugisu and Bukedi districts continued to be made.

It is hoped that a structural map of south-west Uganda, now under preparation, may throw light on the regional structual control of mineralization and act as a guide for future prospecting. Results so far indicate that mineralization is primarily a feature of narrow, tightly compressed synclines between granites. If structural mapping can indicate concealed granites, especially beneath the more competent horizons of the Karagwe-Ankolean, the chances of finding persistent mineralized fractures will be materially increased.

A programme of diamond drilling and pitting on the phosphate ore-body at Busumbu, Bugisu District, was completed. Following analyses of the samples obtained, reserves have been calculated at (a) about 20,000 tons of hard rock with P_2O_5 content of about 30 per cent; (b) in excess of a million tons of soft rock averaging about 15 per cent P_2O_5; and (c) about 13,000 tons of a better grade soft rock associated with the hard rock and of about 21 per cent P_2O_5 content. A bulk sample of the soft rock has been taken for mineral dressing tests to ascertain to what degree its phosphate content can be upgraded.

A systematic programme of pitting on a gridded basis was instituted on the vermiculite deposits of Nemekara and bulk samples were taken for separation of the associated magnetite followed by exfoliation of the cleaned vermiculite. Results to date show a banded occurrence of vermiculite exfoliatable to a product of low density and in quantities of economic importance.

Despite little change in price, production of beryl was more than quadruple that of 1954. Formerly beryl was won as a useful by-product of columbite-tantalite mining, but, with the fall in price of the latter mineral, it has now assumed the position of a major ore-mineral. Beryl occurs in two types of pegmatite; in western Ankole it is found in hydrothermally altered bodies, but in Kigezi it occurs in primary pegmatites. Whereas, in the kaolinised deposits of Ankole underground exploitation follows initial surface excavation, the harder ore-bodies of Kigezi have so far only been opencasted.

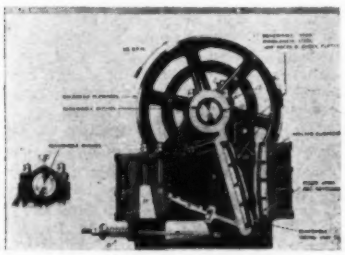
The slight decline in production of wolfram in 1955, as compared with previous years, is a result of preoccupation by the principal operators with plant installation. There is no indication of depletion of reserves and output was tending to rise at the end of the year with more efficient treatment plants coming into operation.

In continuation of the previous year's preliminary pitting on the Hima River limestone of Toro District, an extensive diamond drilling programme was completed. Analyses of the core samples have been completed, but computation of the reserves and grade is still in hand. It is nevertheless apparent at this stage that a very large and valuable deposit is available, closely accessible to the western extension of the railway.

Machinery and Equipment

Crushing Equipment for Mines and Quarries

The efficiency of mining or quarrying operations is dependent in no small measure on the efficiency of the crushing units installed. To achieve a flow of spoil to the processing plant, and even for the simple operations of transportation and loading, it is usually essential that the rock being handled be of suitable screen size.



Sectional view of a Stag jaw crusher

The word "crusher" is a generic term, which embraces many different types of pulverizing machines. For the purpose of this notice it covers jaw crushers, jaw granulators, crushing rolls and rotary granulators. Machines of all these types are manufactured by Edgar Allen and Co. Ltd.

In crushing hard ore, extensive use is made of jaw crushers, which have a movable jaw pivoted at the top, so that maximum movement is given to the smallest pieces. This type of unit is exemplified by the Stag jaw crusher, which is available with a cast steel body in sizes ranging from 12 in x 6 in. to 60 in. x 48 in., the weight range being from 2¼ to 108 tons. The jaw faces are of Imperial austenitic manganese steel (11-14 per cent manganese) and the bodies are cast steel. These units have approximately hourly outputs of from 2 to 240 tons when crushing limestone. The power required is 10 brake H.P. for the 12 in. x 6 in. size and 200 H.P. for the 60 in. x 48 in. size. The speed ranges from 260 to 170 r.p.m.

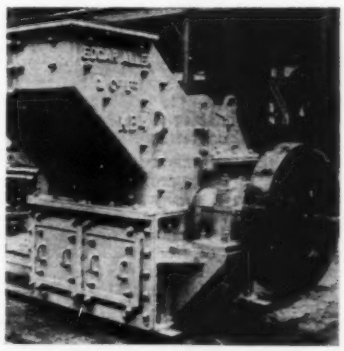
For many purposes it may be desirable to handle ore in smaller sizes than are normally produced in a jaw crusher. This need is met by the jaw granulator, which resembles a jaw crusher in its principle of construction, but is of the single toggle type. Stag jaw granulators are obtainable in sizes ranging from 9 in. x 4 in. to 30 in. x 7 in., having an approximate output, when crushing medium hard limestone to ¼ in. and under, of 2½ to 11 tons per hour. The power required ranges from 6 brake h.p. to 35 brake h.p.

In many situations ease of transportation is a requirement of prime importance to the user. One of the designer's foremost aims is, therefore, to achieve a substantial reduction of weight without any sacrifice in strength. The combination of great strength with low weight is a feature of the Stag plate frame crusher, intended for the smallest sizes, which ranges from 9in. x 5 in. to 24 in. x 14 in. This machine has a frame built up of steel plates, so that it may readily be dismantled and transported in difficult country.

After the primary crushing operation it is frequently desirable to reduce the crushed ores to finer sizes about ¼ in. and under. For this purpose it is common practice to use high speed crushing rolls of heavy construction, which consist essentially of a pair of cylinders rotating in a horizontal plane. The rolls may be smooth or corrugated and they may run at the same or different speeds.

In many mining operations the crushing plant includes Stag crushing rolls, which usually run at a peripheral speed of from 700 to 1,000 ft. per min., but are sometimes operated at still higher speeds. The economical range of reduction is usually 4 to 1, the rolls diameter required for a specific reduction being governed by the maximum size of feed that can be nipped without slipping.

The frame of these machines is in one piece cast solid with the two pedestals for receiving the bearings of the fixed roll.



The K.B. Rotary Granulator

The bearings for the second roll have machined soles, which slide in dovetailed grooves and are held in position by powerful springs attached to forged steel tension rods passing through bearings and frame. The shells themselves are of manganese steel or chromium steel, specially heat-treated, and are fitted to cast iron centres in such a manner that the shell may be easily renewed when necessary. Each roll shaft is fitted with a heavy cast iron belt pulley, which also acts as a flywheel. The rolls are spring-controlled and are driven by two separate belts, one open and one crossed, no spur gearing being used. Alternatively each roll can be vee-rope-driven from individual motors. Adjustable automatic feeders are provided when required.

When crushing stone, the size of material most easily handled by rotary granulators varies between about 3 in. and 1 in. The Stag K.B. granulator will reduce materials such as asbestos, copper ore, hard chalk, felspar, fluorspar, gypsum, limestone, magnesite, phosphate rock, slate, shale, soapstone, terra cotta, etc. It may also be employed as a pulverizer for finer products, in which instance it is fitted with lower screens. The capacities of the smallest and largest machines, when crushing limestone to give a major product of 1 in. and under, are respectively 6—10 and 60—70 tons per hour.

DIRECT-TO-LINE CONTACTOR STARTERS

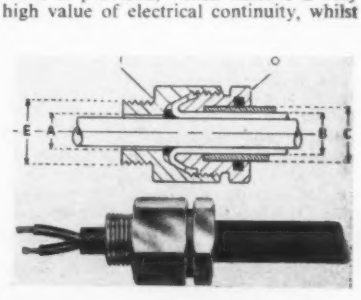
A new range of push-button contactor starters has recently been introduced by The General Electric Co Ltd. Starters now available are suitable for use on three-phase supplies at ratings up to 7½ h.p. at 600 volts. The range is to be extended shortly to cover ratings up to 30 h.p.

The starters incorporate several interesting features, including a new design of four-pole vertical-lift contactor unit which complies fully with BS.775—1956. This standard stipulates new and more onerous requirements than those hitherto applicable to such equipment, including mechanical duty; these new G.E.C. contactors are in Class IV which calls for 5,000,000 trouble-free operations. The contactor arc-box is of moulded alkyd a new insulating material noted for its excellent non-tracking and arc-resisting properties. Another feature is that all the contracts are faced with a minimum silver thickness of 3/64 inch and that they are easily replaceable.

GLANDS FOR ARMOURED AND UNARMOURED CABLES

A new type of patented cable gland, suitable for all armoured and unarmoured cables, has been developed and is being manufactured by Hill Porter (Newcastle) Ltd., and is being distributed by their associated company, Electricals Ltd.

When used with armoured or braided cables, the design of the gland is such that effective clamping of this armour or braid is provided, which ensures a very high value of electrical continuity, whilst



Non-flameproof gland—construction illustration above—suitable for all armoured and unarmoured cables

there is the desirable mechanical feature that, since the armour or braid is not clamped at the point where it passes round the radius of the male portion of the gland, the effect of an axial pull is to tighten the grip, so that compliance with B.S.S. 542—1947 test is easily achieved.

Further to this, as the male portion rotates on a less radius than the female portion, which is normally firmly attached to the apparatus to be connected, the difference in frictional torque of the two parts to the armour or braid of the cable, attains the result that the cable itself does not turn or twist on tightening up the gland.

Though normally supplied in brass, these glands can be supplied in cadmium plated mild steel, and are being manufactured, to commence with, in three sizes, these being particularly applicable to cables used for telephones, lighting, signalling, indicator and remote control, smaller switchgear and motors.

ISOTOPE GAUGE CONTROLS FUEL ROD SHEATHING

Canada's two nuclear reactors, NRX and the new NRU, are both water cooled (the latter by heavy water). This provides low temperature operation and consequently thin aluminium is used to sheath the uranium fuel rods. Any weakness in this aluminium sheath would be extremely dangerous since a rupture would allow release of active fission products into the cooling circuit.

Isotope Products Ltd. have just completed the construction and installation of a gauge to control this aluminium sheath thickness for the NRU fuel rods. This gauge is basically a version of Isotope's standard density Gammagage used in mining, chemical, food, petroleum and other industries. In this application, a very large density difference is available since uranium is one of the heaviest metals (density 18.5) and aluminium is of the lightest (density 2.7).

The heart of this gauge is a three curie source of iridium 192 which is contained in a 150-pound lead container. The container has been designed to allow a sharply defined radiation beam to emerge with about 20 degrees spread. The sheathed fuel rod passes through the beam and the complete width of the rod is scanned in this beam.

Beyond the rod are two ionization chambers.

In operation, the source container and the ionization chamber case are mounted rigidly a fixed distance apart. First a rod section with exactly the correct sheath thickness on either side is put into the beam. One of the two ionization chambers is fitted with a rotating shutter and this is then adjusted to bring the electrical signals from the two chambers to exactly same value—that is into balance. Thus the two chambers act as a balanced system.

Once the instrument has been so calibrated, the trial rod section is replaced by a fabricated rod. This is run through the radiation beam on rigid rollers. When the uranium core shifts so that the sheath is thinner on one side, thicker on the other, the result is that more radiation from the iridium source reaches one chamber than the other. The gauge is so sensitive that if the uranium core is displaced by as little as two 1,000ths of an inch this can be instantly detected.

Technical Briefs

Vacuum Melting in Metals Production

Vacuum technology is becoming increasingly important to the metal industry. This point was stressed by Mr. J. Durant, director of public relations for the National Research Corporation, at the third National Symposium on vacuum technology, held in the United States during October.

Vacuum melting is being carried out to improve the properties of standard ferrous and non-ferrous metals. In the U.S., some 5,000 tons of standard ferrous and non-ferrous metals will be refined by vacuum melting this year. The process is claimed to improve the quality of the metal by removing dissolved gases such as oxygen, nitrogen and hydrogen, eliminating mechanically entrapped gas pockets and reducing chemically-held oxides and nitrides.

It is indicative of the potential importance of vacuum melting in the metals field that the fatigue life of 5,2100 steel is increased 300 per cent by use of the process, and the electrical conductivity of copper is increased by 3 to 4 per cent.

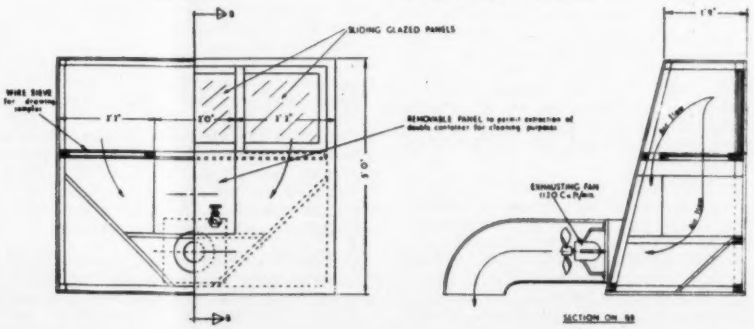
FLOAT AND SINK TESTING CABINET

A cabinet for carrying out float and sink tests on prepared coal samples for washery screens is in use at Mansfield Colliery in the East Midlands Division, N.C.B. The most satisfactory liquid for carrying out these tests is carbon tetrachloride, but as this is highly toxic, care has to be taken to ensure that the atmosphere is not contaminated by fumes of carbon tetrachloride.

The object of this cabinet is to provide such a safeguard. The tests are carried out in a totally enclosed cabinet, and exhaust ventilation is provided to ensure that the operators are always in an atmosphere of fresh air. Draught is provided by an electric fan with a displacement of 1,120 cu. f.p.m. There is interior illumination, and the light switch is interlocked wth the fan motor starter, thus ensuring that the fan is always running whilst the cabinet is in use.

The test is carried out in a container and after test the sample is removed from the container and placed on a wedge-wire screen to drain. The carbon tetrachloride drains off and is collected in a tank at the bottom of the apparatus. The fan exhausts at the bottom of the chamber, and the mixture of air and gas passes to atmosphere at a safe position.

The float and sink testing cabinet


SLIDING GLAZED PANELS
REMOVABLE PANEL to permit extraction of drum container for cleaning purposes
EXHAUSTING FAN
SECTION ON BB

METALS TESTING DEVICE

A new metals-testing instrument designed by a French scientist, M. Pierre Chevenard, has been received by the U.S. Shell Development Company's Materials Engineering and Corrosion Laboratory at the Emeryville, California, research centre. Called the Chevenard Creep and Relaxation Tester, the instrument is said to be the only one in the United States.

According to the company, the only other Creep and Relaxation Tester on the North American continent is in the Chalk River laboratories of the Canadian Atomic Energy Commission. The instrument is designed to determine the mechanical properties of metals at elevated temperatures and to examine their resistance to creep.

ETCHING METHOD USES LITHIUM FLUORIDE

A research technique, described recently, involves the use of an etching solution and crystals of lithium fluoride. When the crystals are etched with a special acid solution, atomic imperfections in the crystals are revealed and can easily be photographed. The imperfections, called "dislocations," are the focus of great scientific interest, since they are believed to hold the key to the strength of such crystalline materials as metals and ceramics.

Engineering materials, such as structural steel, must necessarily be made with the common, or garden, variety of crystals. The defect in these crystals which is responsible for their weakness is called a "dislocation." When a piece of steel stretches or fails in service, dislocations are thought to be moving inside the individual crystals of the metal.

The technique now developed permits the physicist to study the deformation process in much more detail than he could by older means.

MINING MISCELLANY

Iron ore deposits believed to be very large in extent have been discovered in Hatay, south-eastern Turkey.

★

The Pakistan Government has started extensive field work in Baluchistan, where high grade iron ore has been found. The discovery was made in the Dalbandin area of the Chaghi district of the former Baluchistan province. Chromite and copper are associated with the rock formation of the area.

★

In a recent speech at St. Louis, Mr. H. Danforth Starr, a Cerro de Pasco vice-president, has forecast an overall increase of 45 per cent above present levels in the production of refined metals from its Peruvian properties by 1959. He anticipates that a substantial proportion of this increase will be in slab zinc and expects zinc production to reach 150 tons.

★

The Spanish government has issued a directive which would appear to make it impossible for foreign capital to participate in the Spanish zinc industry. All Spanish undertakings applying to the government to mine or smelt zinc must establish that their government is held exclusively in Spanish hands. The Board and management must also be composed of Spanish nationals.

★

Cable Belt Ltd. has received its first order for a cable belt conveyor for Australia. This conveyor is for the Wallarah Coal Co., New South Wales, and will have an ultimate length of 10,000 ft., with a lift of 650 ft. It will be driven by a 500 h.p. motor. Belt width is 36 in. The conveyor will be installed in the surface drift at Wallarah.

★

Addressing the tenth session of the Polish Seym (Parliament), Mr. Stefan Jedrychowski, chairman of the State Commission for Economic Planning, said it was envisaged that coal output would go up by 15,500,000 tonnes in the period 1955-60; i.e., by 24 per cent less than in the Six-Year Plan. However, output per working day will increase from 283,000 tons in 1955 to 360,000 tonnes in 1960.

★

Following the decision of the Caterpillar Tractor Co. to set up their own manufacturing organization in the U.K., the Birtley Co. Ltd., concluded satisfactory negotiations for the sale to the American company of their earth-moving equipment business, including the factory and plant. A new company, known as Birtley Engineering Ltd. has been formed to carry on the departments engaged in the design and fabrication of coal preparation plant and materials handling equipment, which were excluded from the sale.

★

The Birmingham Chamber of Commerce, taking over when the Government financial backing was withdrawn from the London section of the British Industries Fair earlier this year, is to hold the Fair at Birmingham from May 6 to 17, 1957. This event will take place at Castle Bromwich in the largest single exhibition hall in the world. Every section of British industry is invited to participate. So much eagerness has been shown to participate in this continuation of the Fair that already half the available stand space has been booked.

★

The 9th International Liege Fair will be held from April 27 to May 12, 1957. Owing to its geographical position, its industriousness and the high density of its population, Belgium has proved itself a fine testing ground for the sale of any kind of merchandise, technical product, plant or machinery. The International Liege Fair is a strictly technical one and claims the highest attendance of any fair of this type anywhere. Its principal sections are devoted to mining equipment, metals, light and heavy engineering, and industrial electricity. The U.K. representative is Mr. R. C. Liebman, 178 Fleet Street, London, E.C.4. Telephone, City 5889.

★

To meet the demand for pig iron in the Union of South Africa, it has been decided to erect a new blast furnace alongside the two existing blast furnaces at the Newcastle works of the African Metals Corporation Ltd. The capacity of the furnace will be 180,000 tons and will raise the total capacity at Newcastle to 330,000 tons. Some of this capacity will be used for the production of ferro manganese. During the last financial year African Metals shipped 16,831 tons of ferro-alloys overseas compared with 9,391 tons in the previous year.

★

Henry Meadows, a member of the Associated British Engineering group, has supplied two 27.5 k.v.a. diesel-driven generating sets for the supply of electric power for the Royal Society International Geophysical Year Expedition to the Antarctic. They will be the only source of power for all equipment and will operate unattended for long periods.

★

Prompt action by Oldham and Son Ltd. recently gained an order for Britain at the expense of German competitors. After fire wrecked the lamp room of a colliery in Belgium, destroying 2,000 Oldham miners' cap lamps, and 1,000 lamps of German make, Mr. Arthur Bull, an executive director of the firm, flew to Belgium to offer help, followed closely by 1,500 new lamps from the Denton works. In re-equipping the colliery, the mine company had the opportunity to start afresh with the best lamps available, and Oldham's received an order to replace all the destroyed lamps, with additional orders for an extra 3,000 lamps. Before his "snap" trip to Belgium, Mr. Bull had returned from a flying visit to collieries in the parched and mountainous region of the North-West Frontier of Pakistan—so remote that camels are used to move coal from the pits to the nearest railhead. Here also, repeat orders for Oldham Lamps were gained as a result of the performance—in extremes of temperature—of the first deliveries.

PORTUGUESE METALS STATISTICS

Japan now occupies fourth place as a buyer of Portuguese wolframite (84 tonnes), 36,785 tonnes of roasted/leached pyrites went to Germany as well as another shipment of 500 tonnes of china clay during August this year.

The August export figures are (in tonnes): Tungsten-bearing ores, 331; cassiterite, Nil; cupreous pyrites, 29,780; roasted/leached pyrites, 36,785; haematite, 12,448; magnetite, 2,692; manganese, 410; white arsenic, 104; tin metal, 11.

Exports for September were (in tonnes): Tungsten bearing material, 317 (includes about 40 tonnes residues); cassiterite, 10; cupreous pyrites, 48,889; other pyrites, 13,200; haematite, 8,200; magnetite, 2,540; white arsenic, 132; tin metal, 7,697 (kilos).

No official figures are published for material such as beryl tantalite/columbite and any other material that can be used for atomic purposes, but it is known that 23 tonnes of beryl and some small lots of Ta205/Cb205 were exported.

PERSONAL

On December 31, Mr. D. P. C. Neave is to resign from the board of New Broken Hill Consolidated.

★

Mr. H. F. Akehurst has been elected to the board of British Insulated Callender's Cables. He will hold the executive position of director (Overseas Operations) as from January 1, 1957.

★

Mr. C. W. Peyton, manager of overseas representatives and agencies, the B.T.H. Export Co., has retired. He is succeeded by Mr. J. F. Pym.

★

Mr. J. H. Shiner has been appointed president, marketing, and Mr. H. A. Wallace, vice-president, manufacturing, of Massey-Harris-Ferguson.

Obituary

JOHN ROMAINE GOVETT

We regret to report the death of Mr. John Romaine Govett, Chairman of Consolidated Zinc Corporation, at the age of 59. Mr. Govett was to have become president of Consolidated Zinc on January 1, 1957.

Prominent in the fields of investment trust and base metals for many years, Mr. Govett was a partner of Govett Sons and Co., during the inter-war period, and in 1926 joined the board of Consolidated Zinc Corporation.

When Imperial Smelting Corporation was formed in 1929 to establish the zinc industry in the United Kingdom, he joined the board of that body and, in addition, was an original director of New Broken Hill Consolidated.

During the second world war, Mr. Govett was released from military duties to take over the chairmanship of Zinc Corporation, Imperial Smelting and New Broken Hill.

Metals and Minerals

Lithium Institute formed in the United States

The establishment of the American Lithium Institute, Inc., for the purpose of conducting research on lithium and its compounds has been announced by the three major U.S. lithium producers—American Potash and Chemical Corporation, Foote Mineral Co., and the Lithium Corporation of America.

In a joint announcement, the three companies stated that the Institute—a non-profit making organization—had been formed to meet the growing need for a central organization staffed to direct research on problems of an industry-wide nature. The Institute will also act as an agency for the correlation and dissemination of technical information on lithium. It will have offices in Princeton, N.J., where a technical library and literature service will be maintained.

The Institute expects to support an extensive programme of research and development on problems involving the use of lithium in the fields of chemistry, ceramics, metallurgy and nucleonics. Projects will be assigned to appropriate colleges and research institutions, but will be guided by the Institute's technical policy committee, composed of representatives drawn from the three member companies.

This development underlines the growing importance attached to lithium, not only because it is reputed to be a key material in the fusion reaction, but also because many new uses for the metal and its compounds have been developed in recent years. Tremendous future promise for lithium metal is shown in such potential outlets as improved light metal alloys, new catalysts for the polyolefin plastics industry, and fuels for aircraft and guided missiles. These promising applications support the already expanding uses of lithium salts in porcelain enamels, air conditioning and multi-purpose greases.

The expanding prospects for lithium were discussed earlier this month by Mr. George S. Wheaton, vice-president of American Potash and Chemical Corporation, at the Chemical Mining Industry Conference in San Francisco. Mr. Wheaton said that there was currently great activity with regard to exploration of lithium prospects, particularly in Canada. This was a distinct reversal of the situation a few years ago, when none of the mining companies paid much attention to lithium prospects. Actually there is no strong immediate demand for additional supplies.

Foote Mineral owns extensive deposits in North Carolina. Lithium Corporation, too, has a North Carolina mining operation and also purchases from Quebec Lithium, which is now a major producer of spodumene concentrates from the LaCorne area in Northern Quebec. A subsidiary of American Potash and Chemicals, American Lithium Chemicals, is operating on the ore produced by Bikita Minerals in Southern Rhodesia. Obviously all these operations have substantial reserves.

MAGNESITE IN 1955

According to statistics released by the Bureau of Mines, U.S. Department of the Interior, estimated world production of magnesite rose in 1955 to 4,900,000 tons, an increase of 11 per cent. The largest producer was again Austria with 1,094,412 tons.

Crude magnesite mined last year in the U.S. increased 74 per cent in quantity and 90 per cent in value compared with 1954. Quantity sales of caustic-calcined magnesia, refractory magnesia, and dead-burned dolomite increased by 11, 45 and 59 per cent respectively, compared with 1954 figures. There was a considerable increase in the tonnage of olivine mined. Magnesia derived from raw sea water, sea-water bitterns, and well brines equalled 50 per cent of the total U.S. magnesia production in 1955, the balance being from magnesite, brucite and dolomite.

ATOMIC FUEL PRICES

In order to stimulate development of peaceful uses of nuclear energy throughout the world, the U.S. will make nuclear fuel for use in power research reactors available to other nations at prices identical with those charged by the Atomic Energy Commission to American users. The charge will be on a sliding scale depending on the degree of enrichment. President Eisenhower has also approved the purchase at specified prices of the fissionable materials, plutonium and uranium 233, produced in foreign reactors fired with U.S. atomic fuel. The U.S. will buy all such materials produced abroad up to June 30, 1963.

The prices charged by the Government for atomic fuel used in the U.S. remain secret. However, the Atomic Energy Commission has announced the prices it will pay for plutonium and uranium 233 produced in reactors in the U.S. from July 1, 1962, to June 30, 1963. These are $12 a gram for plutonium metal and $15 a gram for uranium 233. The prices are the same as those which will be paid for plutonium and uranium 233 from foreign reactors.

NEW ASBESTOS MILL

A new mill, under the name Star Asbestos Co., was erected in the Eastern Transvaal, South Africa, early this year, states the Philadelphia organ, *Asbestos*. It is situated in the Kaapsche Hoop area in the vicinity of New Amianthus and Munnik Myburgh Mine. The new mill plant uses a novel milling process, which is a radical departure from traditional methods. The plant is fully automatic, so that the fibres produced are always of equal quality. The milling process is combined with an automatic grading system, as a result of which the fibre produced is not only very clean with a very low dust content, but is also excellently graded. Present capacity is about 300 tons of fibres of all grades per month, and the company intends to raise it to 600 tons monthly.

FRENCH ALUMINA PROJECT

Two major French aluminium producers, Pechiney and Ugine, in co-operation with foreign interests, are to build an alumina plant in French Guinea with an initial capacity of 480,000 tons per annum, which is to go into operation by 1960. Negotiations and technical studies previously reported as being in progress have now reached the final stages. The companies hope that negotiations with the French Government and the local administration on certain practical aspects will be successfully concluded in the near future. The plant would supply alumina to North America as well as to the aluminium plant at Edea in French Cameroons, which is to start production by the end of this year. It will process the large local bauxite deposits. Last March Aluminium, Ltd., agreed to participate in this project.

RESEARCH ON RHENIUM

A two-year research programme on the use of rhenium in electron tubes has been initiated at Battelle Institute, Columbus, Ohio, under the sponsorship of the Air Force Cambridge Research Centre, Cambridge, Mass. Rhenium is a "scarce" metal with physical and metallurgical properties similar to those of the refractory metals, tungsten and molybdenum. It costs almost as much as platinum. The good ductility rhenium exhibits after temperature is in marked contrast to the brittleness of tungsten, which is commonly used as a heater material for electron tubes. As part of the current investigation technologists at Battelle will evaluate rhenium's vibration resistance as a heater element when subjected to repeated temperature cycling.

STOCKPILING JAMAICA BAUXITE

The programme to stockpile Jamaica type bauxite moved rapidly to achievement, states the report of the U.S. Office of Defence Mobilization in its report for the first half of 1956. Options under an earlier Defence Production Act contract were exercised to provide larger tonnages for delivery during the five-year period covered by the contract; some deliveries were made into the stockpile under this contract. Barter contracts calling for delivery over five years will provide for filling the gap remaining towards achievement of the minimum and long-term stockpile objectives as now calculated. The five-year barter contracts are designed to permit the suppliers to construct necessary mining and shipping facilities in providing the bauxite required for the stockpile.

NEW YORK PLATINUM FUTURES MARKET OPENS

As already announced in these columns platinum trading commenced last Monday on the New York Mercantile Exchange. The principal purpose of this development appears to be the establishment of a futures market in New York, but it remains to be seen whether the facilities as at present revealed will prove sufficiently attractive to traders. Dealings on the first day are reported at 600 oz. at an average of $103 per oz. for January delivery. By Wednesday, however, the quotation was down to $101 and somewhat significantly no figures appear to have been released for trading since the opening day. This inevitably raises a query as to whether transactions on the first day will prove to be in any way typical. One difficulty appears to be that the commission payable on forward transactions is so high as to represent more than the usual profit margin taken in the market. Should this, in fact, be the case, dealings are likely to be hampered and it may well be that the forward prices which on Monday were being quoted at $104.50 for April delivery may have to be discounted by a dollar or more.

COBALT PRICE LOWER

This week both the American and U.K. cobalt prices have been cut. In New York the price for rondelles is down 25 c. to $2.35 per lb. in 550 lb. lots. In the U.K. cobalt metal delivered to consumers' works is now quoted at 19s. per lb. as against 21s. No reason has been given for these price reductions but it would be a reasonable guess that economy from the more efficient production of a greater volume of metal provides the explanation.

U.K. MAGNESIUM PRICE UP

Magnesium ingot prices rose at the end of last week for the first time in some 18 months and are now quoted at 2s. 5½d. per lb. for lots of 10 tons or more as compared with last week's price of 2s. 4d. Alloy and powder prices have also risen.

COPPER · TIN · LEAD · ZINC

COPPER CONTINUES DULL

Copper has continued to mark time on both sides of the Atlantic and there has been no outstanding development during the past week. The cut of ½ c. per lb. made by one custom smelter to 35½ c. has not been followed by others so far. The main reason for this appears, paradoxically, to be the weakness of demand —there is no purpose in dropping the price by ½ c. if the cut does not stimulate any extra interest. For the present, the big producers are content to take what business offers at the level of 36 c. and wait for things to improve; there is no indication that they want to move any closer to the figure of 30 c. which, when copper was first freed, was seen as an acceptable level.

Custom smelters are reporting some inconvenience in shipping arrivals as a result of the Suez upset but there is no sign yet of any shortage and the producers are still turning out more metal than they are selling so that foreign arrivals are not awaited with great urgency. Interest of the brass mills is slowly increasing but not noticeably affecting demand; the main reason is that with stocks at comfortably high levels all along the pipeline from the primary producer onward there is no incentive for consumers to have any but the minimum inventory. Revere Copper and Brass, from the end of November, raised its prices by ½ c. per lb. for copper products and other fabricators soon fell into line. The increase was attributed to higher wage costs and pension payments.

★

It is understood that Anaconda has offered wage increases to the Chuquicamata miners amounting to £800,000 a year. It remains to be seen whether this will satisfy the union or be permitted by the government. The miners think they have some right to government support because they gave up the ban on overtime at the government's request.

TIN QUIETLY STEADY

Tin has been a firm market in New York with the quotation for spot Straits metal moving slightly upward but later losing ground as news of the Suez evacuation became official; it now stands at 109.12 c. per lb. The market has been kept firm by a combination of useful consumer offtake, the consequences of the closure of Suez and the difficulties in the New York and other American docks. It appears to be the case that the dockers went back to work, as they were bound to do under the Taft-Hartley Act, but then started go-slow operations. The latest news is that a retrospective wage increase has been guaranteed the dockers, but they are still forbidden to strike for 90 days.

The Council of the International Tin Agreement will be meeting in London next Monday. Its two main tasks will be to concern itself with membership and to survey the buffer stock position. The date for the first deliveries of 15,000 tons or cash equivalent is December 15 and the Council should therefore have a good idea what countries have paid and in what form they have done it.

LEAD LESS FIRM

Demand for lead in the United States last week was good but not quite so keen as it has been in recent times. The industry is beginning to feel the end of the spurt in deliveries to the battery makers. October shipments, at 3,011,000 units, were the highest of the year, but below those of October, 1955. At the same time there is no change in the price at 16 c. per lb. The government again entered the market for stockpile lead but it was believed that accepted offerings were only slight compared with recent amounts. There is speculation on how many more times the government will appear as a buyer of domestic metal since the goal for the lead stockpile is believed to be in sight. Refined lead deliveries in October fell to 45,254 tons against 47,519 tons a month earlier. Output was 54,815 tons in October against 53,530 in September; the October figure was the highest since March, 1944. Stocks rose on the month to 42,314 tons from 40,542 tons.

ZINC STILL WAITING

There has been little of interest passing in the American zinc market where metal is still selling on the basis of 13.50 c. per lb. East St. Louis for prime western grade. The government has again accepted offerings for the stockpile delivery in mid-January. Stockpile buying in one form or another is still very necessary to the metal in view of the continuing inadequate demand for zinc diecasting. It was reported that in the last week of November the automobile industry would make 150,000 cars — the greatest number for any week this year. So far the offtake for Detroit — after many optimistic forecasts—has failed to come up to expectations, but there is now more confidence that better business is at hand.

The London Metal Market

(From Our L.M.E. Correspondent)

The firmer tone which was evident in markets at the end of last week was maintained after the week-end, but business is still on a somewhat restricted scale. It would seem that the main reason behind this upward movement was the general belief that the figures issued by the Treasury for the month of November would indicate a sharp fall in Britain's gold and dollar reserves, and this in turn gave rise to speculation abroad that it would be found necessary to make a further devaluation of sterling. It is difficult to form an opinion as to the extent these uncertainties concerning the future value of the £ are affecting metal prices, but in any event the speech by the Chancellor of the Exchequer appeared to allay suspicion anyhow temporarily, and in the middle of the week prices were marked down all round.

Demand for copper is only of a routine nature, and in view of the oil situation it is difficult to foresee any change in this state of affairs. In America the offtake of the metal is reported satisfactorily with producers reasonably well sold for near delivery.

A feature of the tin market has been the further narrowing of the backwardation to about £10 following another rise of just under 200 tons in the stock figures in the U.K. This indicates that, apart from the arrival of Continental tin, Straits metal which was diverted round the Cape is beginning to arrive again. On Thursday morning the Eastern price was equivalent to £835 per ton c.i.f. Europe.

Lead and zinc values show little change. There are no indications of a cessation in the American stockpiling activities in these metals which balances the already noticeable slackening in demand by consumers both in this country and on the Continent as a result of the shortage of oil supplies.

Closing prices and turnovers are given in the table overleaf:

LONDON METAL AND ORE PRICES, DECEMBER 6, 1956

THE WEEK ON THE L.M.E.

	November 29 Buyers	November 29 Sellers	December 6 Buyers	December 6 Sellers
Copper				
Cash	£275½	£276	£272½	£273
Three months	£277	£277½	£274	£274½
Settlement	£276		£273	
Week's turnover	5,600 tons		4,150 tons	
Lead				
Current ½ month	£116½	£116¾	£115½	£115¾
Three months	£116	£116¼	£114¾	£115
Week's turnover	3,375 tons		4,950 tons	
Tin				
Cash	£846	£847	£830	£831
Three months	£835	£836	£823	£824
Settlement	£847		£831	
Week's turnover	685 tons		645 tons	
Zinc				
Current ½ month	£101¾	£102	£101½	£101½
Three months	£97¾	£97½	£97½	£97½
Week's turnover	2,825 tons		2,825 tons	

METAL PRICES

Aluminium, 99.5%, £198 10s. per ton

Antimony—
English (99%) delivered, 10 cwt. and over £210 per ton
Crude (70%) £200 per ton
Ore (60%) bases 23s. 6d./24s. 6d. nom. per unit, c.i.f.

Arsenic, £400 per ton

Bismuth (min. 1 ton lots) 16s. lb. nom.

Cadmium 12s. 0d. lb.

Cerium (99% nett), £13 18s. lb. delivered U.K.

Chromium, 6s. 11d. lb.

Cobalt, 19s. lb.

Copper, £273 per ton

ORES AND OXIDES

Bismuth .. 65% 8s. 6d. lb. c.i.f.
18/20% 1s. 3d. lb. c.i.f.

Chrome Ore—
Rhodesian Metallurgical (semifriable) 48% .. £17 8s. 0d. per ton c.i.f.
" Hard Lumpy (45%) .. £17 8s. 0d. per ton c.i.f.
" Refractory 40% .. £12 15s. 0d. per ton c.i.f.
" Smalls 42% .. £15 9s. 0d. per ton c.i.f.
Baluchistan .. £18 15s. 0d. per ton c.i.f.
Columbite, 65% combined oxides, high grade .. 190s./205s. per unit

Lithium Ore —
Petalite min. 3½% Li_2O .. £8-£10 per ton f.o.b. Beira
Lepidolite min. 3½% Li_2O .. £8-£10 per ton f.o.b. Beira
Amblygonite basis 7% Li_2O .. £35-£40 per ton f.o.b. Beira
Magnesite, ground calcined .. £28 0s./£30 0s. d/d
Magnesite Raw (ground) .. £21 0s./£22 0s. d/d
Molybdenite (85% basis) .. 8s. 5d. nom. per lb. (f.o.b.)

Titanium Ore —
Rutile 95/97% TiO_2 .. £95 per ton c.i.f. Aust'n
Ilmenite 52/54% TiO_2 .. £11 per ton c.i.f. Malayan
Wolfram and Scheelite (65%) .. 227s. 6d./232s. 6d. per unit c.i.

Manganese Ore Indian
Europe (46%-48%) basis 155s. freight plus 15% surcharge .. 140d.-150d. nom. per unit c.i.f.
Manganese Ore (43%-45%) .. 115d. nom. per unit c.i.f.
Manganese Ore (38%-40%) .. 110d. nom. per unit, (including duty)

Vanadium —
Fused oxide 90-95% V_2O_5 .. £12½-£13½ per unit c.i.f.
Zircon Sand (Australian) (65-66% ZrO_2) .. £20 per ton c.i.f.

Germanium, 99.99%, Ge. kilo lots 3s. 4d. per gram

Gold, 251s.

Iridium, £29/31 oz.

Lanthanum (98/99%) 15s. per gram

Lead, £115 15s. per ton

Manganese Metal (96% - 98%) £259/£265 according to quantity

Magnesium, 2s. 5½d. lb

Nickel, 99.5% (home trade) £600 per ton

Osmium, £24/27 oz. nom.

Osmiridium, nom.

Palladium, £8 0s./£8 10s. oz.

Platinum U.K. and Empire Refined £34/£35 oz.
Imported £37 nom.

Quicksilver, £83 10s. ex-warehouse

Rhodium, £42. oz.

Ruthenium, £15/£17 oz.

Selenium, 112s. nom. per lb.

Silver, 80½d. f.oz. spot and 80¾ f'd.

Tellurium, 15s./16s. lb.

Tin, £831 per ton

Zinc, £101½ per ton

LONDON STOCK EXCHANGE PRICES, DECEMBER 5, 1956

Finance	Price Dec. 5	+ or — on week
African & European	55/-	+1/3
Anglo American Corpn.	7½	+⅛
Anglo-French	22/-	+9d
Anglo-Transvaal Consol.	27/6	+1/3
Central Mining (£1 shrs.)	53/9	+1/3
Consolidated G'fields	58/-	—9d
Consol. Mines Selection	33/9	+3/1½
East Rand Consols	1/7½	+1½d
General Mining	68/9	.....
H. E. Prop.	7/6	.....
Johnnies	41/6	+9d
Rand Mines	66/3	+1/3
Rand Selection	35/-	+1/10½
Union Corporation	39/-	+3/6
Vereeniging Estates	5⅛	—⅛
Writs	35/7½	+4/4½
West Wits.	35/9	+2/3
Rand Gold		
Blyvoors	22/-	+6d
Brakpan	6/9	+7½d
Buffelsfontein	28/1½	+3/-
City Deep	11/3	+3d
Consol. Main Reef	15/6	.....
Crown	31/3	+7½d
Daggas	39/4½	+2/6
Dominion Reefs	18/-	+1/6
Doornfontein	22/6	+2/3
Durban Deep	28/1½	+1/3
E. Champs	4/3	+1/-
E. Daggas	9/3	+6d
E. Geduld (4s. units)	30/3	.....
E. Rand Props.	48/1½	+2/6
Geduld	3⅛	+⅛
Govt. Areas	3/6	+3d
Grootvlei	18/10½	+1/3
Harteebeestfontein	45/4½	+4/6
Libanon	7/3	+9d
Luipaards Vlei	11/1½	+1/4½
Marievale	18/7½	+1/-
New Kleinfontein	3/7½	—1½d
New Pioneer	14/6	+1/-
Randfontein	35/6	+5/-
Robinson Deep	7/6	.....
Rose Deep	8/6	.....
Simmer & Jack	4/-	.....
S.A. Lands	27/6	+3/1½
Springs	2/10½	+6d
Stilfontein	26/9	+1/6
Sub Nigel	22/6	+7½d
Vaal Reefs	30/3	+2/9
Van Dyk	2/3	+3d
Venterspost	14/3	+9d
Vlakfontein	16/3	+7½d
Vogelstruisbult	14/9	+1/3
West Driefontein	5	+⅛

Rand Gold contd.	Price Dec. 5	+ or — on week
W. Rand Consolidated	30/7½	+2/6
Western Reefs	29/9	+2/4½
O.F.S. Gold		
Freddies	6/6	.....
Freddies Consolidated	3/7½	+1½d
F.S. Geduld	76/10½	+4/4½
Geoffries	3/3	+6d
Harmony	24/6	+1/-
Loraine	5/-	+9d
Lydenburg Estates	15/3	+2/3
Merriespruit	4/9	.....
Middle Wits	9/-	+1/6
Ofsits	53/1½	+4/4½
President Brand	56/10½	+4/4½
President Steyn	32/9	+1/9
St. Helena	27/9	+2/3
Virginia Ord.	9/3	+9d
Welkom	17/3	+2/3
Western Holdings	75/-	+6/10½
West African Gold		
Amalgamated Banket	1/6½	+½d
Ariston	4/-	+1½d
Ashanti	14/7½	+4½d
Bibiani	2/-	+1½d
Bremang	1/4½	.....
G.C. Main Reef	1/6½	+½d
Konongo	1/4½	+1½d
Marlu	½d	.....
Taquah	10½d	.....
Western Selection	6/10½	+1½d
Australian Gold		
Gold Mines of Kalgoorlie	14/1½	+4½d
Great Boulder Prop.	12/3	+7½d
Lake View & Star	16/3	+4½d
Mount Morgan	17/3	+3d
North Kalgurli	7/3	+6d
Sons of Gwalia	1/10½	+1½d
Western Mining	11/-	+6d
Miscellaneous Gold		
Cam & Motor	8/6	.....
Champion Reef	13/-	+3d
Falcon Mines	8/-	+3d
Globe & Phoenix	23/-	.....
Motapa	9d	.....
Mysore	3/3	—1½d
Nundydroog	17/6	+1½d
St. John d'El Rey	55/6	+2/6
Zams	43/9	—1/3

Diamonds and Platinum	Price Dec. 5	+ or — on week
Anglo American Inv.	8⅛	—⅛
Casts	22/4½	—1/-
Cons. Diam. of S.W.A.	10/6	—3d
De Beers Defd. Regd.	4½	—⅛
De Beers Pfd. Regd.	13½	—½
Pots Platinum	14/6	+1/1½
Waterval	24/3	+3d
Copper		
Bancroft	46/-	+3/-
Chartered	66/6	+6d
Esperanza	2/9	+6d
Messina	8⅛	+⅛
Nchanga	12⅛	+⅛
Rhod. Anglo-American	98/9	+4/4½
Rhod. Katanga	44/6	+7/-
Rhodesian Selection	43/6	+1/-
Rhokana	38	+½
Rio Tinto	4⅛	+⅛
Roan Antelope	24/3	—1½d
Selection Trust	4⅛	+⅛
Tanks	7⅛	—⅛
Tharsis Sulphur Br.	5½	.....
Tin (Eastern)		
Ayer Hitam	22/-	.....
Gopeng	12/4½	.....
Hongkong	5/7½	.....
Ipoh	25/-	.....
Kamunting	9/6	+3d
Kopong Dredging	4/6	.....
Kinto Tin Mines	19/3	.....
Malayan Dredging	14/7½	+3d
Pahang	11/7½	.....
Pengkalen	16/3	+3d
Petaling	7/6	.....
Rambutan	26/-	+3d
Siamese Tin	12/4½	.....
Southern Kinta	16/1½	.....
S. Malaya	11/6	.....
S. Tronoh	6/6	.....
Sungei Kinta	16/3	.....
Tekka Taiping	7/4½	.....
Tronoh	12/6	+4½d
Tin (Nigerian and Miscellaneous)		
Amalgamated Tin	10/3	.....
Beralt Tin	47/3	+3d
Bisichi	4/9	.....
British Tin Inv.	21/9	+1/6
Ex-Lands Nigeria	2/1½	.....
Geevor Tin	19/4½	+3d

Tin (Nigerian and Miscellaneous) contd.	Price Dec. 5	+ or — on week
Gold & Base Metal	1/3	+1½d
Jantar Nigeria	4/6	.....
Jos Tin Area	13/9	.....
Kaduna Prospectors	1/6	.....
Kaduna Syndicate	2/1½	—1½d
London Tin	9/9	.....
United Tin	9d	.....
Silver, Lead, Zinc		
Broken Hill South	63/6	+2/-
Burma Mines	3/9	.....
Consol. Zinc	64/9	+3/3
Lake George	14/-	+1½d
Mount Isa	24/6	—3d
New Broken Hill	46/9	+9d
North Broken Hill	107/6	+5/-
Rhodesian Broken Hill	11/7½	+4½d
San Francisco Mines	27/6	+6d
Uruwira	3/9	.....
Miscellaneous		
Base Metals and Coal		
Amal. Collieries of S.A.	2½	—⅛
Associated Manganese	36/6	+3d
Cape Asbestos	8/10½	+3d
C.P. Manganese	23/6	+1/6
Consol. Murchison	51/10½	+1/3
Natal Navigation	63/9	.....
Turner & Newall	101/-	+8/3
Wankie	17/3	+1/-
Witbank Colliery	5⅛	.....
Canadian Mines		
Dome	$26	.....
Hollinger	$51	+3¼
Hudson Bay Mining	$170	+2
International Nickel	$196	+8½
Mining Corpn. of Canada	£7½	—¼
Noranda	$110	+6
Quemont	£7½	+¼
Yukon	4/6	+3d
Oil		
Apex	42/-	—1/-
Attock	31/6	+6d
British Petroleum	126/-	+12/10½
Burmah	80/7½	+7/6
Canadian Eagle	64/9	+6d
Mexican Eagle	24/6	.....
Shell	141/3	+7/3
T.P.D.	41/6	+3/9
Ultramar	51/9	+2/3

Mining Finance

Thoughts on the Central Mining - Gold Fields Merger

The disclosure at the end of last week that the prospective merger between The Central Mining and Investment Corporation and Consolidated Gold Fields of South Africa is to be based on their respective asset positions at June 30, 1956, provides another of the essential pieces of information necessary for the assessment of the possible impact on the market flowing from this important operation. So far, Gold Fields has published a balance sheet showing its financial position as at June 30, 1956, and no figures are due in the ordinary way from Central Mining until May next year. But rumour has is that the merger is not far off, and thus it is interesting to note that the earlier of the companies' year-end dates—June 30 and December 31 respectively—should have been chosen as the basis for the transaction.

The absence of fully informative balance sheet figures from both companies makes it virtually impossible to judge whether the present market prices of 54s. for Central Mining and 59s. for Gold Fields constitute with any accuracy a correct proportionate relationship to their respective assets. The operative word in this matter is " proportionate " as no one would expect market prices to reflect fully the balance sheet values of both companies. Nor would this be necessary in order to effect a merger.

Be that as it may the market appears to have arrived at a logical assessment of the position. Presumably this has been based on balance sheet figures available which demonstrate that no great difference exists between the two companies' break-up values. It follows that only a small margin should also exist between market quotations of each company's £1 shares and this is actually the case.

It is perhaps worthwhile remembering that any adjustments to asset values of the two companies as at June 30, 1956—which will have to be made before the merger goes through—will only be market factors if they result in an alteration of the present proportionate relationship. If upward or downward adjustments were to be the same in both cases, market prices should not, in theory, change. Conversely, if one company's assets were revalued above those of the other, that company's shares should rise, while those of the other would remain unchanged. And on the whole, there seems to be a greater chance that any change in the present relationship would favour Gold Fields. But this may have already been discounted and the two shares seem on available date to be reasonably valued.

In dealing specifically with the figures involved, it has been necessary to deduct preference stocks outstanding and to make allowances for the margin of market values for quoted investments over book figures. Even so, the consolidated balance sheet of Central Mining at December 31, 1955, showed net assets of about £19,000,000, while those of Gold Fields at June 30, 1956, came out at £26,000,000. Central Mining's investment values, of course, will have depreciated substantially since 1955 owing to the fall in gold share quotations, but this will have been more than offset by the rise in market value of its Trinidad Oil holdings.

Although the margin between these asset calculations appears quite substantial, the difference in issued ordinary capitals results in a break-up valuation for each company of not far off £5 a share. The scale is actually tipped in Gold Fields favour thus accounting for its price being the higher.

Meanwhile, it is possible to give yield considerations as one of the reasons for the present small variation between the prices of the two shares. Both companies have been placed on a 7 per cent basis, and as one is paying a dividend of 4s. and the other 3s. 9d., their respective prices cannot obviously be the same. While on the subject of share valuations, it seems worthwhile considering what might happen in the remote chance of the merger failing to go through. So far during 1956 both Central Mining and the Gold Fields have touched high points of around 61s. but their low levels of 35s. and 51s. 9d. respectively, have shown a very marked contrast. On the face of it there seems every reason—even in the absence of a merger—why Gold Fields should continue to be valued at their present price.

The company has large holdings in many of the most profitable gold mines in South Africa, while its forward-looking and expanding exploration policies need little elaboration. In the case of Central Mining the position is not so easy to define as the Corporation's mines fall largely into the older category. These shares might thus be expected to decline. At the same time, the possibility of a tax-free distribution of Trinidad Oil money cannot be entirely ruled out. Central Mining has 4,000,000 ordinary shares in issue and has made a profit of £8,300,000 from the sale of its large stake in this company. And even if tax, of say, 50 per cent became payable, this would still leave £4,000,000—or £1 per share—available for distribution.

The latest Central Mining announcement deals specifically with this question of Trinidad Oil profits. The company points out that it does not consider the sale a transaction on trading account, and therefore intends to transfer the profit involved to reserve. Central Mining was the founder of Trinidad Oil and not surprisingly has always regarded its holding as a permanent asset.

Whether or not it will be possible to uphold this view is a matter to be decided between the Corporation and the taxation authorities. Although the possibility cannot be ruled out that half the sum may find its way into the Treasury, the strengthened reserve position has enabled the recommendation of an increased dividend of 3s. 9d. per share in respect of the year ending December 31, 1956, from 2s. 9d. previously. Only an interim of 1s. 10½d. is due to be paid, the distribution of the balance being dependent upon nothing going seriously wrong before the end of the year.

RIEBEECK PROSPECTUS

The prospectus under which 6,998,000 shares of 10s. are offered at par in Riebeeck Gold Mining Company, reveals little that was not already known regarding the possibilities for this potential gold mine. Applications for snares must reach the company not later than December 12—or in another six days' time. The issue has been underwritten in varying proportions by the General Mining and Finance Corporation, the Anglo American Corporation of South Africa and Middle Witwatersrand (Western Areas).

When last writing about Riebeeck shares on November 16, we emphasised the particularly inauspicious time at which this issue had to be made. Since then things have not improved and the premium on Riebeeck 10s. shares has been whittled down to almost nothing. While it would thus seem probable that the underwriters may be called upon to play their part, it would be all too easy to write off Riebeeck on such a temporary consideration alone. If one is prepared to take the longer view—which is admittedly difficult in present gold markets—a purchase of Riebeeck at their present depressed level could well prove to have been a wise move when things get better. Meanwhile, and this applies to almost every other section of stock markets, some temporary loss might be incurred.

GOLDS STAGE RECOVERY

Both in the U.S. and the U.K. markets experienced better sentiment during the past week. *The Dow Jones Industrial Index* rose from 466.62 on November 29 to 488.55 by December 5, and *The Financial Times Industrial Index* from 161.5 to 166.9. Lessened international political tensions were mainly responsible for New York's behaviour, but it is much more difficult to explain rises in London, after Mr. Macmillan's depressing statement regarding the U.K.'s economic position.

The outstanding feature of the week was the gold share section in which prices, for no apparent reason, other than fears of devaluation, staged an all round recovery.

Demand for Kaffir shares by far exceeded supply and the three new uranium producers, Doornfontein, West Drie and Harties, attracted particular attention. Diamonds remained steady despite news of new Russian deposits, while platinums made useful gains.

Coppers had a better week, and after being depressed to a low point of 35s. on forced selling, Rho-Kats later resumed a more rightful position at over 44s. Tin held recent gains and even moved up in places. Esperanza were steadier

on the new discovery and plans for its exploitation, while Trepca hardened on news that the Pasic claim had been dropped. Oils moved up throughout the list.

VAAL REEFS PAYS 1s.

The main feature of December dividends from Anglo American gold and uranium mines—details of which appear elsewhere in these columns, was the maiden distribution of 1s. per share by Vaal Reefs Exploration and Mining. Although earnings since production started at this property last May have suggested that the company would be able to make an early payment, surprise was generally expressed that it should have come so soon. Other interes ing declarations included the drop to 6d. from 7½d. last December in Brakpan's distribution and a cut of 3d. to 2s. 9d. by Daggafontein. These were both disappointing. Recent rises in grade milled and subsequent higher working profits had given rise to hopes of an increased payment from S.A. Lands. But this optimism was apparently ill-founded for the dividend has been more than maintained at 1s. 6d.

HARTIES' URANIUM PROFIT

Most outstanding amongst November returns from South African gold and uranium producers was that in respect of Hartebeestfontein. This mine's initial uranium profit before loan redemption and interest repayments was as high as £138,000 or 38 per cent of total working profit earned. The two other maiden uranium prafits were West Driefontein's, which amounted to £35,000 before loan redemption etc., and Doornfontein's at £10,000 on the same basis

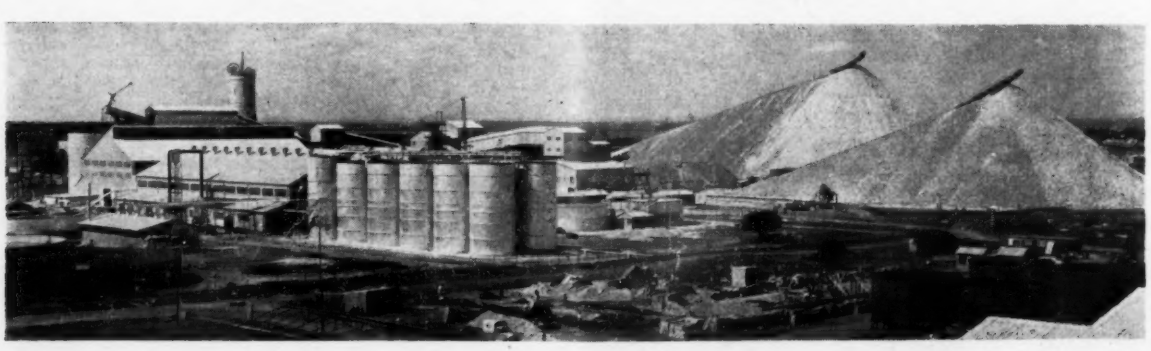
Other interesting features from the reports were rises in grade to 9.3 dwt. from 8.8 dwt. at F.S. Geduld and to 8.25 dwt. from 7.8 dwt. at Vaal Reefs. P. Brand milled 2,000 more tons than in October, while P. Steyn's throughput made the impressive increase of 11,000 tons. This had a most beneficial effect on costs at the latter mine, which were sharply decreased to 49s. 2d. from 54s. 10d. Welkom's report was the most encouraging for a long time and disclosed an increase in crushing by 7,000 tons and profits by £15,000. No return was issued by Merriespruit and that from St. Helena's was disappointing. Returns were based on a gold price of 250s. 10d. per ounce compared with 250s. 11d. in October. Our usual table of results appears alongside.

Rand & Orange Free State Returns for November

Company	November, 1956 Tons (000)	Yield (oz.)	Profit† (£000)	Year ends	Current Financial Year Total to date Tons (000)	Yield (oz.)	Profit† (£000)	Last Financial Year Total to date Tons (000)	Yield (oz.)	Profit† (£000)
Goldfields										
Doornfontein *a*	78	31,000	150·4	J	368	145,518	655·6	254	101,925	418·1
Libanon	98	21,980	56·3	J	482	107,753	273·4	487	105,791	296·3
Luipaards Vlei *b*	84	15,009	10·0	J	423	75,702	53·7	413	88,094	141·8
Rietfontein	26	5,771	16·9	D	342	64,267	195·0	288	65,737	216·9
Robinson	68	14,171	4·2	D	847	170,891	50·1	911	194,254	203·7
Simmer & Jack	100	18,140	22·8	D	1,118	196,966	194·5	1,310	219,459	188·9
Sub Nigel	66	18,620	48·1	J	332	96,182	280·3	332	105,474	405·8
Venterspost	120	28,926	64·3	J	622	137,535	341·5	616	143,993	385·0
Vlakfontein	50	17,713	87·7	D	496	177,530	878·4	426	156,303	799·1
Vogels *a*	100	23,725	120·0	D	1,103	272,214	850·4	1,132	291,786	1196·8
West Drie *a*	75	70,377	581·7	J	375	348,681	2879·7	355	274,329	2174·5
Anglo American										
Brakpan	105	17,897	10·3	D	1,175	207,317	137·7	1,174	200,614	165·7
Daggas *a*	216	48,346	268·8	D	2,425	547,824	3092·3	2,455	560,933	3422·7
East Daggas	94	15,407	29·7	D	1,046	171,858	368·5	1,052	175,320	496·3
F. S. Geduld *c*	47	21,847	97·7	S	93	42,188	185·9	—	—	—
Loraine *a*	60	11,405	L8·0	S	119	22,590	L16·6	83	13,763	L54·8
President Brand *a*	61	46,763	385·1	S	121	92,578	764·8	103	82,428	682·7
President Steyn *a*	93	35,849	222·0	S	175	67,830	399·7	164	58,902	324·9
S. A. Lands	88	19,600	75·2	D	986	208,439	725·3	1,020	194,865	603·4
Springs	126	14,745	8·5	D	1,388	167,417	110·7	1,330	172,049	111·0
Vaal Reefs *d*	54	22,275	125·9	D	346	128,083	623·6	—	—	—
Welkom *a*	87	21,312	50·1	S	167	41,312	84·9	164	33,435	32·2
Western Holdgs. *a*	88	39,142	253·3	S	176	78,081	505·1	146	55,485	330·1
West Reef Ex. *a*	120	25,691	58·3	D	1,318	368,901	549·3	1,299	246,169	611·3
Central Mining										
Blyvoor *a*	102	57,653	418·9	J	535	300,320	2212·8	533	301,900	2255·6
City Deep	159	30,611	15·0	D	1,695	327,508	54·5	1,777	337,114	14·0
Cons. M.R.	162	22,444	8·4	J	835	115,743	48·3	877	122,908	104·3
Crown	269	41,409	2·0	D	3,128	441,816	206·1	3,303	527,029	543·2
D. Roodepoort	179	31,739	56·5	D	2,012	347,787	581·2	1,997	336,920	555·4
East Rand Prop.	210	55,689	177·8	D	2,335	607,186	1968·8	2,338	572,944	1830·5
Harmony	78	30,023	156·4	J	391	153,333	838·0	352	130,418	660·9
Modder East	138	14,423	8·0	J	702	72,133	44·2	645	68,272	41·1
Rose Deep	46	7,150	0·2	D	488	77,833	5·2	624	97,567	56·9
J.C.I.*										
E. Champ d'Or *a*	12	343	L27·7	D	150	8,436	L294·5	219	16,888	L373·3
Freddies Cons. *a*	58	13,406	L29·4	D	676	138,443	L382·6	885	145,779	L535·0
Govt. G.M.A. *a*	221	30,188	0·5	D	2,567	329,143	16·8	2,780	350,076	172·2
Randfontein *a*	199	20,455	L344·8	D	2,481	246,858	L3343·4	2,833	310,888	L3463·1
Union										
East Geduld	144	44,277	323·5	D	1,588	489,818	3511·0	1,634	503,787	3794·3
Geduld Prop.	104	16,291	27·4	D	1,144	181,351	350·8	1,029	182,616	495·3
Grootvlei	195	41,933	230·2	D	2,154	464,052	2532·7	2,132	461,973	2699·6
Marievale	72	18,895	88·1	D	785	206,114	954·8	786	203,716	981·9
St. Helena	116	33,636	187·3	D	1,198	347,587	1897·9	1,140	302,554	1487·0
Van Dyk	77	12,355	2·1	D	878	142,308	18·9	882	144,751	24·3
General Mining										
Ellaton *a*	32	7,000	17·0	D	353	80,499	290·0	338	96,071	444·9
S. Roodepoort	29	6,678	24·7	J	146	33,845	124·5	138	31,174	111·6
Stilfontein *a*	93	37,665	226·9	D	986	389,750	2304·0	927	364,216	2273·5
W. Rand Cons. *a*	149	23,100	L97·1	D	2,365	260,179	L1042·4	2,583	295,606	41·4
Anglo-Transvaal										
Hartebeestfontein *a*	75	37,125	225·8	J	345	169,278	1011·1	245	101,017	454·1
N. Klerksdorp *a*	11	1,178	L7·4	D	120	13,588	L58·3	123	15,230	L18·1
Rand Leases	163	25,510	5·2	J	884	136,612	33·5	911	144,532	152·3
Village M.R.	34	5,345	8·7	J	166	25,637	43·3	172	25,346	48·2
Virginia O.F.S. *a*	95	23,940	58·7	J	446	86,817	274·2	341	72,328	148·5
Others										
N. Kleinfontein	100	11,966	0·5	D	1,139	134,629	10·1	1,174	139,724	58·7
Wit. Nigel	18	3,991	7·4	J	90	19,929	37·0	92	19,881	42·1

Operations at Merriespruit were suspended throughout the month. L indicates Loss. † Working profit. * Working profit includes Sundry Revenue. *a* Excluding profit from Uranium, Acid and Pyrite. *b* Main Reef only. *c* Production began January 1956. *d* Production began May 1956.

The reduction plant at Hartebeestfontein G.M. as seen from the top of the uranium leach plant. Brown tanks are shown in centre with waste rock dumps on right. The excavation in centre is the site of the uranium laboratory



FINANCIAL NEWS AND RESULTS IN BRIEF

Casts' Liquidity.—The group balance sheet of Consolidated African Selection Trust at June 30, 1956, disclosed an expansion in total assets to £10,888,418 from £8,541,976 at the end of the previous year. Fixed assets were not much changed at £1,587,102 (£1,328,345), but reflecting the recent receipt of compensation money from the Sierra Leone Government, current assets expanded sharply to £7,762,855 from £5,675,170. The company's financial position was thus extremely good, and net liquid assets amounted to no less than almost £4,500,000. During its past financial year Casts made group net profits after taxation of £861,395 (£892,697). Dividends absorbed £872,019 (£654,014) and the balance carried forward moved up to £504,181 from £359,805. Mr. A. Chester Beaty is Chairman, Meeting London, December 13.

Anglo-Vaal's Investments.—During the year ended June 30, 1956, the book value of Anglo-Vaal's quoted investments in companies other than subsidiaries was increased to £4,497,221 from £3,565,038. The market value of these securities also moved up to £4,850,553 from £4,330,811. Book value of quoted investments in subsidiary companies at £1,697,967, however, showed little change from the previous year's entry and in view of the adverse conditions which have prevailed in gold share markets, it was surprising that the market value of these holdings should have been able to rise to £2,084,381 from £1,614,903 at the end of the previous year. Reflecting further investments made during the past financial year, Anglo-Vaal's previous surplus of £700,000 was turned into a deficit of $500,000.

Overall assets at £10,981,330 compared with the previous figure of £11,568,196.

Total revenue earned by the company during the past financial year rose to £1,041,608 from £974,870. Mainly responsible for this increase was net revenue from interest, commissions, etc., to £651,543 from £447,150. Dividends provided a little more income, but, as was to be expected, profits from share dealings suffered a serious setback. Dividends absorbed £516,329 (same) and the balance carried forward improved to £385,830 from £379,124. Mr. S. G. Menell is chairman.

Trepca: Pasic Case Dropped.—The action by Mr. Pasic before the English High Court, based on the judgment of a Belgrade County Court of February 10, 1954, is being discontinued. This statement was made jointly by Selection Trust and Trepca Mines. Mr. Pasic has undertaken to serve formal notice of discontinuance of actions against both companies, and he will accordingly pay taxed costs involved. Trepca Mines balance sheet at September 30, 1956, showed total assets of £2,192,554 compared with the previous year's figure of £2,191,480. Current assets of £1,161,203 exceeded current liabilities by about £800,000.

Capital Expenditure at Harties.—At the meeting of Hartebeestfontein Gold Mining the chairman stated that the cost of the future expansion programme planned for the property had been estimated at £6,000,000. This sum included amounts already spent during the current financial year and the total would be spread over the next four years.

Esperanza's Discovery.—At the recent meeting of Esperanza Copper and Sulphur, Mr. J. Ivan Spens referred to a new orebody of rich cupreous pyrites which had been discovered. To date ore available for cheap opencast workings was estimated to exceed 250,000 tons. Of this quantity, a substantial tonnage should be available for profitable sale over 1957 and 1958, without any milling. Further, exploration in adjacent sections is proceeding and results are awaited with interest. The decision to bring this new orebody into production would, said Mr. Spens, means delay in re-starting the modified Limni plant. For this reason operations and expenditure on the Limni Mill would be phased to coincide with the new operations.

Good Liquidity at Sungei Besi.—Current assets of The Sungei Besi Mines at March 31, 1956, improved to £601,855 and exceeded current liabilities by about £465,700. Fixed assets also expanded to £164,841 from £153,058. The loan to Harrietville (Tronoh) was reduced to £7,500 from the previous figure of £54,500 and overall assets moved up to £774,196 from £669,170. During the past financial year Sungei Besi made net profits after expenses and taxation of £96,162 (£82,607). Dividends obsorbed £37,612 (£36,385) and the balance unappropriated increased to £86,458 from £80,833. Mr. G. W. Simms is the chairman.

Tanganyika Diamond and Gold.—Fixed assets of Tanganyika Diamond and Gold Development Company at June 30, 1956, expanded to £362,250 from £338,940 at the end of the preceding year. Current assets of £69,045 exceeded current liabilities by about £38,500. During 1955-56 the company made net profits of £15,124, compared with the previous year's loss of £3,752. After expenditure on fixed assets of £23,310 (nil), unappropriated profits declined to £38,526 from £46,712. Mr. E. J. Donaldson is chairman. Meeting, Johannesburg, December 10.

New Guinea Gold.—Total assets at June 30, 1956, rose to £1,434,590 from £1,350,771. Current liabilities of £36,605 were more than fully exceeded by cash and bullion on hand which totalled £160,092 (£71,968). During the past financial year the company made net profits of £139,174. Dividends absorbed £55,904 and the balance carried forward was £38,192. Mr. J. Kruttschnitt is chairman. Meeting Sydney, Australia, November **28.**

Kentan Again Makes Loss.—A progress report for three months' operations ended September 30, 1956, discloses that Kentan Gold Areas—which owns over 76 per cent of Geita Gold Mining Company—made a loss of £23,180 compared with £2,225 in the previous quarter. The increased deficit, it is stated, was due entirely to power shortages. A new engine, which the company is installing, has not yet been commissioned and additional power from this source will not now be available until early 1957. Interruptions in power supplies are therefore likely to continue.

A borehole intersection at Lone Cone has disclosed a value of 7.2 dwt. of over 24ft. Further drilling is in hand to delimit the extent of the orebody so exposed. Development in the company's North-East Extension gave values of 5.6 dwt. over 38 ft. This compared with 5.4 dwt. over 25 ft. during the previous quarter.

Malayan Tin's Grade.—The directors' report of Malayan Tin Dredging in respect of the year ended June 30, 1956, states that high output and profit achieved were largely due to exceptionally high grade ground treated by dredge No. 3A. Yet as the value of ground due to be worked in 1957 will be nearer the usual average, some fall in production must be expected. During 1955-1956 Malayan Tin made net profits after tax and expenses of £475,528 against £102,742. Dividends absorbed £207,000 (£135,000) and the carry forward increased to £120,767 from £119,120. The company's balance sheet disclosed an expansion in total assets to £2,734,558 from £1,973,688. Current assets at £1,844,971 exceeded current liabilities and future taxation by some £830,000. Mr. E. V. Pearce is chairman. Meeting, London, December 14.

New Vaal Farms.—On June 30, 1956, current liabilities of New Vaal Farms at £13,172 exceeded current assets by nearly £7,000. The company's total assets, including an accumulated loss of £92,406 (£67,253), were valued at £284,818 and compared with the previous year's figure of £250,687. Apart from £114,429 5 per cent Convertible Redeemable Debenture Stock, unsecured loans of £72,776 (£50,000) were outstanding at the year-end. During twelve months ended June 30, 1956, New Vaal Farms made a loss of £25,152 (£23,474). Lt. Col. R. L. Broad is chairman. Meeting, Johannesburg, December 12.

Waverley Gold.—The balance sheet of Waverley Gold Mines at June 30, 1956, showed total assets at £222,796 compared with £287,177 previously. Mainly due to an expansion in plant machinery and equipment, fixed assets rose to £187,849 from £126,476. Current liabilities of £30,402, together with a loan of £42,000, exceeded current assets by £63,000.

During its past financial year Waverley Gold made a profit of £722, compared with a loss of £1,589 during the preceding year. An accumulated loss of £9,372 (£33,307) was carried to the balance sheet. Lt. Col. R. L. Broad is chairman. Meeting, Johannesburg, December 11.

New Wit Gold.—The market value of quoted investments held by New Witwatersrand Gold Exploration Company at June 30, 1956, showed a decline to £2,145,040 from £2,731,378 at the end of the preceding year. Book value of these holdings was £1,584,293 (£1,560,822). The company's overall asset position declined to £2,034,988 from £2,084,173. Current liabilities at £204,144 exceeded current assets by about £116,600. During the past financial year New Wit Gold made net profits after taxation of £165,160 against £172,481 during the preceding year.

At June 30, 1956, the company's principal investments included widespread holdings in the new and expanding mines of O.F.S., Klerksdorp and the West Wits Line. Lt. Col. R. L. Broad is chairman. Meeting, Johannesburg, December 7.

Current Assets at S. Malayan Tin.—Total assets of Southern Malayan Tin Dredging at June 30, 1956, of £2,884,704

were little changed from the previous figure of £2,795,473. Current assets exceeded current liabilities and future taxation by as much as £1,500,000. A total of 12,189,000 cu. yds. was treated during the year and output amounted to 2,732 tons of tin concentrates. This was equivalent to 0.5 lb. per cu. yd. The company's net profits after taxation were £321,462 (£318,165). Dividends absorbed £276,320 (£266,228) and the balance unappropriated of £77,779 compared with the previous figure of £77,637. Mr. E. V. Pearce is chairman. Meeting, London, December 14.

Ore Reserves at Lake View.—Total ore reserves at Lake View and Star on July 1, 1956, amounted to 3,668,000 at 4.77 dwt. This represented a decrease of 46,000 tons from the previous year's figure although grade improved by 0.01 dwt. per ton. During the year ended June 30, 1956, ore treated rose to 740,518 tons from 731,609 tons and grade declined to 4.71 dwt. from 4.74 dwt. Working costs remained constant at 67s. 3d. and the company made net profits after tax of £218,655 (£208,174). A sum of £100,000 (nil) was transferred to general reserve and unappropriated profit carried forward accordingly fell to £2,109 from £85,710. Lake View's overall assets at June 30, 1956, were valued at £1,575,856 (£1,597,249). Current assets of £823,291 exceeded current liabilities by about £209,600. Sir Joseph Ball is chairman. Meeting, London, December 20.

Outlook for Kepong.—In his address to shareholders of Kepong Dredging Company for the year ended June 30, 1956, Mr. J. H. Rich, the chairman, said that judging by results so far during the current year, it would appear that results should be approximately the same as those received during 1955-56. Mr. Rich also referred to boring at Kepong which had been carried out to ascertain whether or not sufficient payable ore existed below dredging depth to warrant extraction by means other than dredging. Some payable patches had been found—which could be worked by tributors after the dredge closed down—but on the whole the project had proved abortive. Kepong's total assets at June 30, 1956, declined to £215,307 from £234,729. Current assets exceeded current liabilities by £126,000. During its past financial year the company made net profits of £17,494 (£16,220). Dividends absorbed £11,644 (£3,881). Meeting, London, December 14.

Investments of New Central Wits.—Quoted investments held by New Central Witwatersrand Areas at June 30, 1956, had a market value of £411,942 against that at the previous year end of £476,114. The book value was £443,356. During the past year New Central Wits made net profits of £10,820 (£3,904). The company has an interesting gold mining portfolio mainly concerned with the new O.F.S., Far Western Rand and the Klerksdorp mines in South Africa. Mr. M. W. Rush is chairman.

Cementation and Kariba Contracts.—Consolidated balance sheet figures of The Cementation Company at March 31, 1956, showed an improvement in liquidity to £2,849,926 from £2,476,079. Fixed assets rose to £3,271,225 from £2,479,398 and the overall value of assets expanded to £6,103,639 from £4,943,818. Group net profits after tax during the past financial year advanced to £373,346 from £358,330. Dividends absorbed £186,587 (£128,449) and the balance carried forward moved up sharply to £448,892 from £263,566.

In his statement to shareholders, the chairman, Mr. A. R. Neelands, referred to contracts obtained in connection with the construction of the hydro-electric installation at Kariba Gorge on the Zambesi River in Rhodesia. It was hoped that these contracts—which were carried out in association with Messrs. John Laing and Son—would lead to further civil works, for which tenders were submitted. But owing to the main contract being awarded to "Impresit"—an Italian group—the company was not successful. Meeting, London, December 13.

Messina's Higher Distribution.—With a final dividend of 250 per cent on its issued ordinary capital of £330,000 The Messina (Transvaal) Development Company has raised total distribution for the year ended September 30, 1956, to 420 per cent from the previous year's figure of 380 per cent.

Estimated profits of the company and subsidiaries advanced during the past financial year to £2,533,000 from £2,048,150. After providing £690,000 (£586,150) for taxation, and placing 475,000 (£200,000) to reserve, net profits moved up to £1,386,000 from £1,262,000.

Investments of C.M.F.S.A.—Total book value of quoted and unquoted investments held by Central Mining Free State Areas at June 30, 1956, amounted to £2,384,913. Market or director's valuation of these holdings was £2,630,257. Securities represented by this figure included a holding of 2,510,750 shares in Union Free State Coal and Gold Mines (in voluntary liquidation), 1,800,000 shares in Harmony Gold Mining and 371,250 shares (or 10 per cent) in New Consolidated Free State Exploration which holds 1,247,564 Harmony shares and 1,896,580 Free State Saaiplaas Gold Mining shares. C.M.F.S.A. also has a direct holding in F.S. Saaiplaas amounting to 187,216 shares. Mr. P. H. Anderson is chairman. Meeting, Johannesburg, November 19.

Uncertain Outlook for Kwahu.—In his review of operations by Kwahu Mining Company (1925) during the year ended June 30, 1956, Mr. A. Hedley Williams, chairman, referred to the fall of approximately one-third in the market value of the company's investments—£214,165 compared with book cost of £309,992. As the extent of this depreciation was not covered by revenue reserves, no dividend could be recommended under such conditions. The outlook for a dividend in respect of the current financial year, said Mr. Williams, still depended largely on the improvement in market valuation of the company's West African and Cyprus investments.

DECEMBER KAFFIR DIVIDENDS

	Dec. 1956	June 1956	Dec. 1955	June 1955
	s. d.	s. d.	s. d.	s. d.
Brakpan	6	4½	7½	4½
Dagga	2 9	2 9	3 0	2 9
E. Dagga	9	9	10½	9
S. A. Lands	1 6	1 6	1 6	1 4½
Springs	3	2½	5½	—
Vaal Reefs	1 0*	—	—	—
W. Reefs	1 3	1 3	1 3	1 3

* Maiden

MALAYA. Mining Engineers required for group of Tin Mining Companies. Only trained personnel considered. Commencing salary according to training and experience. Provident Fund and non-contributory pension scheme. Three-year contracts with six months' home leave on full pay. Excellent prospects for suitable men. Write, giving full particulars of age, education, training and experience and marital status, to Box 24, Walter Skinner, Ltd., 20 Copthall Avenue, London, E.C.2.

ANGLO AMERICAN CORPORATION OF SOUTH AFRICA, LIMITED

GEOLOGISTS

The Corporation is undertaking an extensive programme of exploration in Africa, and has vacancies for both experienced and inexperienced geologists. Applications are invited from men with good Honours degrees.

Minimum starting emoluments for inexperienced geologists amount to £1,125 per annum. Due recognition given to higher degrees and/or experience.

Leave is at the rate of 55 days per annum accumulative up to three years. Free return passages after three years for single and married men and their families.

Field equipment provided. Accommodation (with hard furnishings) made available for married men.

The Corporation also has vacancies for mine geologists on terms similar to the above.

Opportunity exists for the young geologist to familiarize himself with modern geological practice and equipment.

Applications giving full personal particulars and qualifications, and in the case of experienced men, experience and appointments held, are to be addressed to:—

The Appointments Officer,
Anglo American Corporation of South Africa, Limited,
40 Holborn Viaduct,
London, E.C.1.

AGENCE MINIÈRE ET MARITIME S A
2, RUE VAN BREE - ANTWERP - BELGIUM
Sworn weighers, samplers of ores, metals and residues.
Agents for shippers at European ports and plants.
Telegrams: Rentiers-Antwerp Telex 1693

NEW UNION GOLDFIELDS, LIMITED

(Incorporated in the Union of South Africa)

STATEMENT BY THE CHAIRMAN

The Eighteenth Annual General Meeting of New Union Goldfields, Ltd., will be held on December 14, 1956, at Johannesburg.

The following are extracts from the Statement by the Chairman, **Lt.-Col. R. L. Broad, M.C.,** which was circulated with the Accounts for the year ended June 30, 1956:—

Profits and Appropriations

The realised profit for the year, after taxation, but before providing for diminution in value of investments, was £225,500. Following the procedure of recent years, share investments have been brought into account at cost or Stock Exchange prices or, where there is no quotation, at Directors' valuation, whichever is the lower. On this basis there was a net diminution in value of £527,000, of which £337,000 was covered by transfers from revenue reserves, the balance of £190,000 being met out of taxed profits for the year. After appropriating amounts of £60,000 and £10,000 to Exploration Reserve and Note Redemption Reserve respectively, the balance of unappropriated profit carried forward to the current financial year was reduced from £69,400 to £26,300. The substantial fall in the value of our Company's share investments reflects, in the main, the more or less steady decline in the market prices of shares listed on the Stock Exchange during the period under review. There were many contributory factors to this decline in prices, not the least important of these being the rise in the general level of interest rates both in South Africa and in the United Kingdom. Moreover, the gold mining industry, which is represented in our portfolio to such a large extent, still faces the dilemma of rising working costs against a fixed price for its product, and while inflationary forces persist it is understandable that investors should turn their attention elsewhere.

Profits on realisations of investments fell by £129,300, but against this net revenue from other and more dependable sources increased by £102,200. This indicates that gradually our Company is becoming less dependent upon share-dealing profits as a major source of revenue, which is a reassuring development.

Reserves

Our experience over the past year has come as a salutary reminder of our Company's vulnerability to adverse fluctuations in the market prices of its investment, thus vindicating the cautious financial policy which has been followed over the past five years. It may be taken as a reflection of the basically healthy state of our Company's affairs that it was able to absorb an investment depreciation charge of £527,000, and still show revenue reserves and unappropriated profits totalling £583,200 at the end of the period. At June 30, 1956, our quoted investments had a book value of £2,192,500 (1955—£2,245,600) and a market value of £2,452,300 (1955—£3,238,400). Thus, while the book value remained fairly constant over the year, the market value fell by nearly 25 per cent. Of this market depreciation, slightly more than three-quarters is attributable to our substantial shareholdings in Harmony Gold Mining Company Limited, General Exploration, Orange Free State, Limited, and Dominion Reefs (Klerksdorp) Limited.

Investments

During the year our Company acquired two new investments which hold out considerable promise for the future, namely, Free State Saaiplaas Gold Mining Company Limited and Winkelhaak Mines Limited, and we continue to be substantially interested, directly and indirectly, in a number of developing and producing gold and/or uranium mines in the Orange Free State and the Transvaal whose progress over the past year has, almost without exception, been encouraging. Our direct shareholding in the Harmony Company had a market valuation at October 19, 1956, of £453,000, while the market valuation of the Harmony shares held by our associated financial companies, New Witwatersrand Gold Exploration Company Limited and Lydenburg Gold Farms Company Limited, at the same date totalled approximately £895,000. Our Company, through its indirect holdings, continues to be substantially interested in Blyvooruitzicht Gold Mining Company Limited, West Driefontein Gold Mining Company Limited and Village Main Reef Gold Mining Company (1934) Limited. As to future mining investments, our Company is directly or indirectly interested in several prospective mining areas, notably (a) the Van den Heever's Rust area in the Orange Free State, mainly through its substantial shareholdings in General Exploration, Orange Free State Limited, which entitles it to subscription rights in the newly formed Riebeeck Gold Mining Company Limited; (b) certain portions of the Kinross area on the Far East Rand lying outside the lease area of the Winkelhaak Mine; (c) the "Composite Mineral Area" to the south of the Blyvooruitzicht and West Driefontein mines; and (d) a portion of the "Waterpan Area" to the south and east of the Venterspost and Libanon mines on the Far West Rand.

Over the past year our three small mines, Star Diamonds (Proprietary) Limited, Union Tin Mines Limited and Vellefontein Tin Mining Company Limited, have all made profits which can be regarded as reasonable in the light of the comparatively restricted scale of their respective operations. Our base mineral holdings represent only a very small percentage of our Group's total investments and, in view of long-term inflationary pressures and increasing world demand for many minerals which can be expected to continue for years to come in consonance with expanding world population and rising standards of living, it will be our policy gradually to correct the disparity by increasing our investments in base minerals.

Our principal real estate interests are Greystone Park, a recent project just outside Salisbury, Southern Rhodesia, where the demand for good class, residential properties should continue unabated, and Reservoir Hills Township, within the Durban municipal area. The greater portion of the latter township has been zoned for ownership and occupation by members of the Indian Community, although formal proclamation under the Group Areas Act has not yet taken place. The medium to long-term outlook for this township appears encouraging Generally, it is our policy to keep a limited proportion of our total funds invested in land and estate propositions. This branch of our activities is one that has its attractions in inflationary times, and although it is unlikely to develop into one of our major fields of investment, it should produce a stable source of revenue over the years.

Of our industrial and farming interests, P. J. Joubert Limited and Silverton Tannery Limited are making profits and continue to pay dividends, although both companies have experienced difficult trading conditions over the past year. The Distins-Sagseeds and New Vaal Companies are still incurring losses. In general principle, it is not our present policy to acquire and hold large blocks of shares in industrial undertakings, but rather to spread our investments in this sphere over a wide selection of smaller holdings, operating through our associated company, New Union General Industries Limited, which is now being run on investment trust lines.

Liquid Position

At June 30, 1956, current liabilities totalling £552,700 exceeded current assets by £117,700, compared with an excess of current assets over current liabilities of £54,500 in 1955. Purchases of and subscriptions for, shares in the Free State Saaiplaas and Winkelhaak flotations, as well as in Anglo-Rand (where the purchases were closely related to that company's participation in the Winkelhaak flotation), cost the Company some £328,700, and it was not to be expected that investments of this magnitude could be absorbed without some strain, particularly in view of the depressed market conditions which militated against the sales of existing shareholdings to finance the fresh acquisitions. The present financial year is likely to see the continuation of the fairly stringent cash position.

Exploration and New Interests

Drilling is being carried out on a coal prospect in the Carolina District, Eastern Transvaal, where so far some 20,000,000 tons of coal of a reasonably high calorific value have been proved at relatively shallow depths. An interesting acquisition during the year was the participation with the Johannesburg Consolidated Investment Company Ltd. in portion of the farm "Modderfontein" No. 4, District Vereeniging. This farm constitutes portion of what is known as the "Waterpan Area," where active prospecting operations are being conducted by the Johannesburg Consolidated Investment Company Ltd.

Conclusion

The difficulties encountered over the past year can be almost entirely attributed to adverse share market conditions, which may well prove to have been transitory in nature. In the event of any material improvement in market sentiment, the diminution in value of investments which has been provided for this year, but which after all is not a realized loss, may quickly be recovered. Nevertheless it must be emphasized that from the liquidity angle our Company is still very largely dependent upon a degree of sustained market activity. However, our finances should show a steady improvement with the advent of more of our investments into the list of dividend-payers, and with the prospect of receiving increasing dividends from our direct and indirect stake in the new producers. The overall position of our Group is sound, and the outlook for our major investments and for certain of our interests, which are still in the exploratory stage, is certainly not without encouragement.

LONDON AND RHODESIAN MINING AND LAND COMPANY

SIR JOSEPH BALL'S SPEECH

The annual general meeting of The London and Rhodesian Mining and Land Company, Limited, was held on December 4 in London.

Sir Joseph Ball, K.B.E. (the chairman) presided and, in the course of his speech, said :

The net profit before taxation amounted approximately to £131,000, as compared with £109,000 last year. From this sum falls to be deducted £76,000 in respect of taxation, the comparable figure last year being £60,000—leaving a net profit of £55,000 as compared with last year's figure of £49,000. Your Directors recommend the payment of a first and final dividend of 10%, the same total distribution as for the previous year.

Consolidated Accounts : After all charges, including taxation and dividends for the year, the sum to be carried forward amounts to £54,600, as compared with £50,400 brought forward from last year—an increase of £4,200.

Ranching : The Board are satisfied that our group of ranches already represents an asset of considerable value; but they are also satisfied that by the judicious expenditure of additional capital, the revenue to be derived from them can be substantially increased. Five-year development programmes for both Wiltshire and Lochard have been prepared and a start has already been made in putting them into effect. The profit derived from ranching during the period under review amounted to a sum of over £62,000, as compared with £36,000 in the previous year.

The Group's investment income increased during the year under review to £58,200, as compared with £52,400 for the previous year, and the consolidated profit on realization of stocks and shares amounted to £18,300, the comparable figure for the preceding year being £30,700.

Mining Interests

Mazoe Consolidated Mines : Lonrho continues to own 94% of the issued capital of 128,723 £1 shares and, after paying the dividend, the unappropriated balance carried forward amounted to £6,550, as compared with £350 last year.

Cam and Motor : Lonrho continues to own a substantial interest in this Company which again paid dividends totalling 40% for the year. The Cam and Motor Mine produced 94,476 fine ounces of gold for a mine working profit of £480,400.

Pickstone Mine, which is owned by Cam and Motor, was brought to the production stage in April and is currently crushing approximately 6,500 tons per month. During the three months to June 30 last, 3,792 fine ounces of gold were produced for a working profit of £14,200.

The Arcturus mine, which is owned by Coronation Syndicate Ltd., produced 14,272 fine ounces of gold for a working profit of £61,200.

At the Muriel Mine, which is also owned by Coronation Syndicate Ltd., operations for the year resulted in a mine working profit of £111,300.

Tebekwe, yet another Coronation Syndicate mine, which is approaching the end of its life, nevertheless earned a working profit of £38,500 for the year.

HARTEBEESTFONTEIN GOLD MINING CO. LTD.

LARGE CAPITAL EXPENDITURE PROGRAMME

MR. B. L. BERNSTEIN'S ADDRESS

The annual general meeting of Hartebeestfontein Gold Mining Company Limited was held on November 30 in Johannesburg.

Mr. B. L. Bernstein (the Chairman) who presided, said:

I wish to add the following to my review of the Company's affairs attached to the Report and Accounts already in your hands.

It is our intention to increase the milling rate to 100,000 tons per month as soon as production from the deeper North Western portion of the mine becomes available to augment tonnage drawn from the shallow area now being exploited. To achieve this increase with a high percentage of waste rock discarded in sorting operations, some 130,000 tons per month will have to be delivered to the sorting station. In order to handle additional tonnage, the hoisting capacity at No. 2 shaft is now being increased.

With reference to the shaft sinking programme, it is anticipated that No. 2a sub-vertical shaft will be in commission within two years. Work has also commenced on No. 3 vertical shaft, which will become the main upcast ventilation shaft. It is anticipated that this shaft will be in commission during the first half of 1959. In addition to the cost of sinking and equipping these shafts capital expenditure will be incurred in connection with the extensions to the reduction plant, additional European and non-European housing, excess development in anticipation of increased stoping, additional underground equipment and other equipment, plant and services for the increased scale of operations. The cost of this programme, including amounts already expended on capital works during the current financial year, is estimated to be £6,000,000 which will be spread over the next four years.

Expenditure To Be Met From Own Resources

In view of the Company's high profit earning capacity from gold and uranium, and as full lease and tax payments will not be incurred for some four to five years, your Directors feel that this capital expenditure can best be met by drawing on the Company's own resources. During this period it is anticipated that it will be possible to appropriate the necessary funds from profits to meet this capital expenditure programme, to repay loans on due date and furthermore to make reasonable dividend distributions to shareholders. Naturally these views and the estimates to which I have referred are based on there being no appreciable change in mining conditions and the present levels of capital costs and mining costs.

I have pleasure in advising you that the Uranium Plant is now in production and is already treating some 90,000 tons of slime per month which represents 90 per cent. of its rated capacity. This tonnage is made up of slimes from current gold production supplemented by tonnage from accumulated slimes. Initial testing operations at this plant commenced during September. The usual starting-up and teething troubles and absorption in the new plant were overcome during October and the plant is now operating satisfactorily. The Company will be declaring its first profit from uranium simultaneously with the November gold declaration. It is anticipated that the full production of 100,000 tons per month will be achieved in the near future.

The report and accounts were adopted.

CHENDERIANG TIN DREDGING

MR. ADDINSELL'S STATEMENT

The 42nd Annual General Meeting of Chenderiang Tin Dredging Ltd., was held on December 4 in London, **Mr. Jack Addinsell,** the chairman, presiding.

The following is from his circulated statement : —

The improved results have been continued during the financial year ended in March last.

Tin ore recovered amounted to 220 tons, an increase of 19½ tons, which realised £35 per ton more than in the previous year. Output from the tribute workings produced income of £12,720.

Profit for the year before tax amounted to £40,464, an increase of £12,415. After providing for tax there is £24,762 available. This has been dealt with by transferring £10,000 to general reserve and recommending a final dividend of 15%, making a total of 20% for the year.

Since the close of the financial year the Tin Control (Buffer Stock) Regulations have come into operation. The total amount estimated to be due from this Company is £15,000 and a payment on account has already been made. In future years this item will be shown in the balance sheet as an asset.

For the first six months of the current financial year output was 101¼ tons as compared with 110½ tons for the same period previously. Estimated mine profit up to the end of October, including tribute income, totalled £13,000. A lower rate of output must be expected while a new paddock is being developed at the Sungei Lah section.

The report and accounts were adopted.

PROSPECTOR required by alluvial mining company in BRITISH WEST AFRICA. Applicants must have had previous bush experience and a mining degree or diploma is desirable. Gross starting salary and allowances for a single man £1,320 p.a., married man £1,500 p.a., plus bush allowance. Free passages. Leave of twelve weeks for each twelve months' service granted annually. Married accommodation not available. Send details of age, education, qualifications and experience to : C.12, Mine Employment Department, Selection Trust Building, Mason's Avenue, Coleman Street, London, E.C.2.

Atlas Copco produce world's lightest motor drill

From Atlas Copco, the world's largest manufacturers of pneumatic rock-drilling equipment, comes an entirely new motor drill. It is the Atlas Copco *Cobra*, backed by 50 years' experience of rock-drilling equipment, and developed after extensive field tests.

Weighing a mere 53 pounds, the Atlas Copco *Cobra* is undoubtedly the lightest, handiest motor drill ever brought out. (The usual weight of a motor drill is around 80 pounds.) Yet despite its low weight the Cobra is able to put up a *higher footage* under actual working conditions than other, *heavier* motor drills. It is powerful, robustly constructed and, above all, *100 per cent self-contained!* One man can carry it and start it up *anywhere*.

New exclusive drill features

The Atlas Copco Cobra has 100 per cent air flushing from the built-in compressor. As no exhaust gases are used for flushing, troublesome decarbonizing is eliminated. Another *first-ever* feature is the free-wheeling mechanism for easier starting and more rapid steel changes. The Cobra also incorporates a unique new method of automatic rotation of the drill chuck, a floatless carburettor enabling drilling up to a 45 degree incline and a pull-type starter. The Cobra drills 100 feet to the gallon, has a drilling rate of 26 feet per hour, and can drill holes up to 13 feet in depth.

The right steels for the Cobra

The Cobra—like all Atlas Copco drills—has been developed for use with *Sandvik Coromant* steels, the world's most widely-used integral drill steels. This, of course, adds considerably to the performance of the Cobra. *No drill or steel developed separately could possibly give such equivalently high results.* Atlas Copco drills fitted with Sandvik Coromant steels have proved an unbeatable drilling unit, responsible for the drilling of no less than one billion feet each year.

World-wide sales and service

The Atlas Copco Group embraces Atlas Copco companies or agents manufacturing or selling and servicing Atlas Copco equipment in ninety countries throughout the world. For further details of the equipment featured here, contact your local Atlas Copco Company or Agent, or write to Atlas Copco AB, Stockholm 1, Sweden.

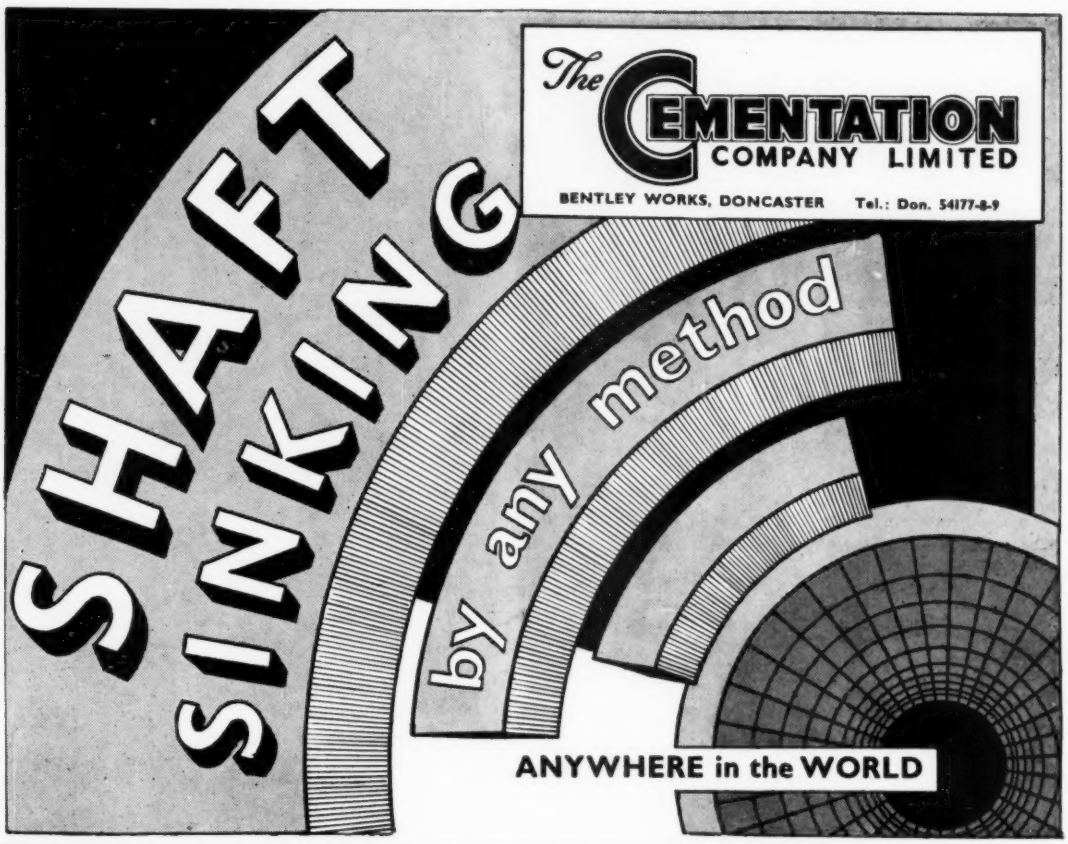
Motor Drill and Breaker in one!
The Cobra converts to breaker in minutes. Only three small parts to change. Reconversion just as quick.

Easily carried anywhere! *Perfectly-balanced carrying handle. Moulded back frame for transporting cross-country.*

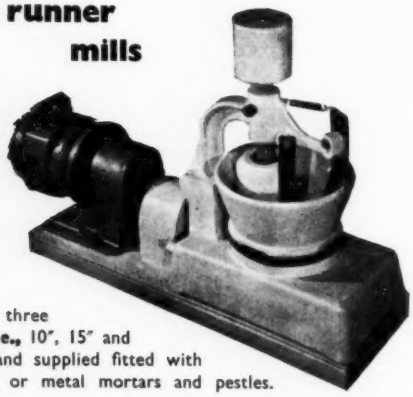
Grinder driven from the Cobra! *A specially light drill steel grinder, powered through the crankshaft, can be supplied if required.*

THE Atlas Copco GROUP OF COMPANIES

Manufacturers of Stationary and Portable Compressors, Rock-Drilling Equipment, Loaders, Pneumatic Tools and Paint-Spraying Equipment



laboratory end runner mills



Available with three mortar sizes, i.e., 10", 15" and 20" diameter and supplied fitted with either ceramic or metal mortars and pestles.

The mortars and pestles are interchangeable. A ceramic set can be used for processing materials adversely affected by contact with metal and a metal set, cast iron or stainless steel, can be carried as a spare set for use on materials for which ceramic is unsuitable. The pestles are arranged to swing clear or lift out of the mortars to facilitate emptying and cleaning.

PASCALL

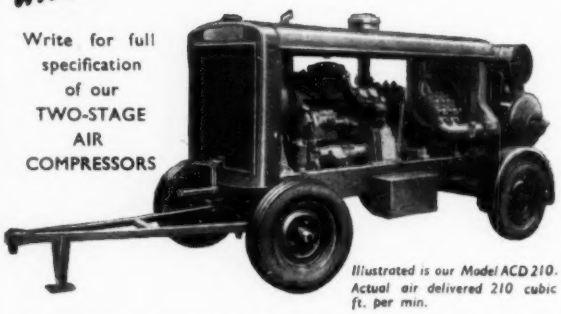
Write or telephone Crawley 25166 for List EN 3012

THE PASCALL ENGINEERING CO LTD
GATWICK ROAD · CRAWLEY · SUSSEX

Designed and Built

For HARD WORK under HARD CONDITIONS

Write for full specification of our TWO-STAGE AIR COMPRESSORS



Illustrated is our Model ACD 210. Actual air delivered 210 cubic ft. per min.

PNEUMATIC TOOLS FOR ALL OPERATIONS

THE
LEAD WOOL CO. LTD.
SNODLAND, KENT

'Phones: Snodland 516/7.
'Grams: "Strength Phone Snodland"

50 YEARS SERVICE—1906-1956

ONE BILLION FEET DRILLED EACH YEAR WITH THESE STEELS

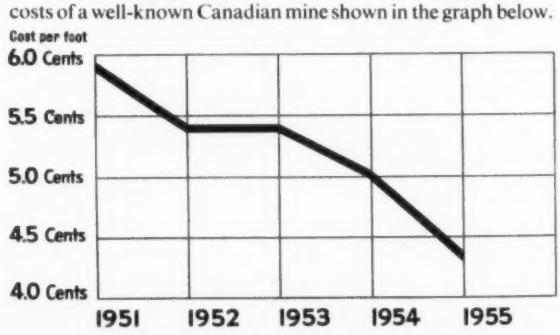
For many years Sandvik Coromant steels have been the world's most widely-used integral drill steels. And as each year passes, their share of the world rock drilling market becomes even larger; responsible for drilling one billion feet annually. The reason behind this ever-increasing demand is their consistently high and uniform quality.

Meticulous production control

Sandvik control every phase of production, from the mining of iron ore and processing of the wolfram ore, to the final tungsten carbide-tipped drill steels. This 'under-one-roof' policy of Sandvik has produced steels of a quality that is always improving; steels that have brought *faster* speeds and *new* economies to drilling. The production of Sandvik Coromant steels is not only strictly controlled, but also influenced by valuable information gained from extensive research. Every year, with the close co-operation of Atlas Copco, hundreds of miles of test drilling is carried out both in Sandvik's own test mine and under actual working conditions.

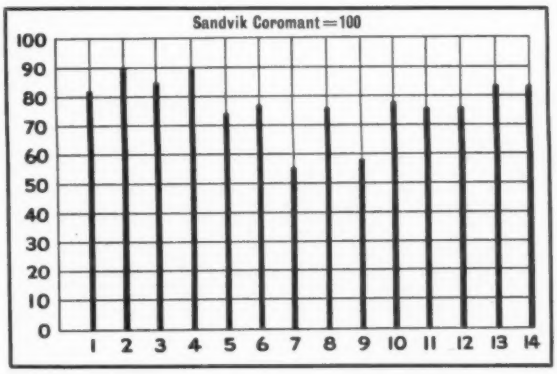
Increased quality brings lower drilling costs

Since the introduction of Sandvik Coromant steels some ten years ago, their quality and life has been continually increased. A longer life means *lower* drilling costs. For example, take the costs of a well-known Canadian mine shown in the graph below.



You'll notice that the cost per foot with Sandvik Coromant steels has decreased by 25% in just four years!

On large-scale drilling tests carried out during 1954-56 at leading Swedish mines and construction projects with different makes of drill steels, Sandvik Coromant steels again proved superior, showing the highest and most uniform quality. The final results gave Sandvik Coromant steels the highest average footage per steel. Here are the average footages of other steels taking part in the 14 tests, compared to the performance of Sandvik Coromant steels, shown as 100.



Sandvik Coromant steels are supplied through the Atlas Copco Group. It is the largest group of companies specialising solely in the development and manufacture of compressed air equipment. It embraces Atlas Copco companies or agents manufacturing or selling and servicing Atlas Copco equipment in ninety countries throughout the world. For further details of the equipment featured here, contact your local Atlas Copco Company or Agent. If you have any difficulty please write to Atlas Copco AB, Stockholm 1, Sweden.

THE *Atlas Copco* GROUP OF COMPANIES

DSS 55

Manufacturers of Stationary and Portable Compressors, Rock-Drilling Equipment, Loaders, Pneumatic Tools and Paint-Spraying Equipment

ROBEY
OF LINCOLN

have recently designed and manufactured
THE MECHANICAL PORTION OF

THE FIRST MULTI-ROPE FRICTION WINDER

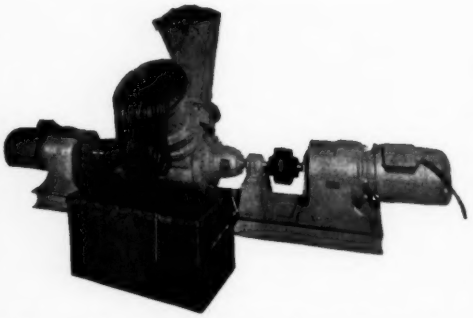
INSTALLED IN THIS COUNTRY

THE ROBEY-CROMPTON POSITIVE POWER BRAKE
incorporated in this equipment has been designed and developed on the duplicate principle, with a complete braking system for each pair of brakes, both incorporating the full safety features.

ROBEY & CO. LTD. P.O. BOX 23, GLOBE WORKS **LINCOLN**

COMET

POWERFUL, POSITIVE-ACTION, SLOW-REVVING PUMPS



A 4" heavy duty pump, driven simultaneously at each end by two 3 h.p. synchronised motors used for such applications as pumping liquorice, tar, soap, etc.

THE COMET PUMP & ENGINEERING COMPANY, LIMITED
JOHNSON ROAD, WEST CROYDON
Telegrams: **Comet, Croydon.** *Telephone:* **Thornton Heath 3816**

WOLVERHAMPTON DIAMOND DIE & TOOL Co. Ltd.

BOARTS and INDUSTRIAL DIAMONDS

Exporters

11 HATTON GARDEN, LONDON, E.C.1.
Telephone: **HOLborn 3017** *Cables:* **Pardimon, London**

Metal and Mineral Trades

A. STRAUSS & CO. LTD.

FOUNDED 1875

PLANTATION HOUSE, MINCING LANE, LONDON, E.C.3

METALS
Telephone : Mincing Lane 5551 (10 lines)
Telegrams : Straussar Phone London

Telex GB LN 8058

RUBBER
Telephone : Mansion House 9082 (3 lines)
Telegrams : Ascorub Phone London

MERCHANTS EXPORTERS IMPORTERS

Non-Ferrous Metals — Virgin, Alloys, Scrap

RUBBER COPPER REFINERS

Members of the London Metal Exchange
Dealer Members of the Rubber Trade Association
Members of the National Association of Non-Ferrous Scrap Metal Merchants

EVERITT & Co. LTD.

40 CHAPEL STREET
LIVERPOOL
Phone: 2995 Central

Teleg. Address: Persistent, Liverpool.

SPECIALITY:
MANGANESE PEROXIDE ORES

We are buyers of:
WOLFRAM, SCHEELITE, VANADIUM, MOLYBDENITE, ILMENITE, RUTILE, ZIRCONIUM and TANTALITE ORES

Suppliers of :
FERRO-ALLOYS & METALS, NON-FERROUS ALLOYS

ESTABLISHED 1869

BLACKWELL'S METALLURGICAL WORKS LTD.

THERMETAL HOUSE, GARSTON, LIVERPOOL, 19

MAKERS OF
FERRO ALLOYS, NON-FERROUS ALLOYS RARE METALS

BUYERS AND CONSUMERS OF
COLUMBITE, TANTALITE, TUNGSTEN MANGANESE and all ORES

Works, Garston. Telegrams: Blackwell, Liverpool

Telegrams:
"BASSETT" PHONE, LONDON.

Telephone:
MANSION HOUSE 4401/3.

BASSETT SMITH & Co. Ltd.

(Incorporating George Smith & Son)

15/18 LIME ST., LONDON, E.C.3

METALS,
ORES (Copper, Zinc, Lead, &c., Complex),
RESIDUES, SKIMMINGS & ASHES
NON-FERROUS SCRAP

Telephone: MON. 5941-3 *Cablet:* AYRTONMET *Telex:* LONDON 2-2475

AYRTON METALS LIMITED

(Members of the London Metal Exchange)

IMPERIAL HOUSE, DOMINION STREET, LONDON, E.C.2

IMPORTERS AND EXPORTERS OF
NON-FERROUS VIRGIN METALS, SCRAP, ALLOYS, ORES, MINERALS AND BY-PRODUCTS
containing
BASE AND PRECIOUS METALS
DEALERS IN PLATINUM GROUP METALS
ADVANCES MADE AGAINST CONSIGNMENTS

U.S. Agents
The Ayrton Metal & Ore Cpn., 30 Rockefeller Plaza, New York 20, N.Y

Cable Address : WAHCHANG, NEW YORK

WAH CHANG CORPORATION

(FORMERLY WAH CHANG TRADING CORPORATION)

233 BROADWAY - - NEW YORK 7, NEW YORK

TUNGSTEN TIN

BUYERS
Tungsten Concentrates, Tungsten Tin Concentrates
Mixed Tungsten Ores
Tungsten Tailings, Scrap, Tips, Grindings
Tin Concentrates—Tin Dross, Tin Furnace Bottoms

SELLERS
Tungsten Concentrates to Buyers' Specifications
Tungsten Salts, Tungsten Powder
Tungsten Rods and Wires
Tungsten Ingots, Tin Oxides, Tin Chlorides

PLANT — GLEN COVE, NEW YORK

ORES METALS

THE ANGLO CHEMICAL & ORE CO. LTD.

(Members of the London Metal Exchange)

PALMERSTON HOUSE, BISHOPSGATE, LONDON, E.C.2.

Cables: "CHEMORE" *Telephone:* LONDON WALL 7255 (8 lines *Telex:* LONDON 8043

SCRAP RESIDUES

GEORGE T. HOLLOWAY

& CO. LTD.

METALLURGISTS & ASSAYERS,
ORE TESTING, WORKS AND
METALLURGICAL RESEARCH LABORATORIES

Atlas Road, Victoria Road, Acton,
LONDON, N.W.10

Telephone No.: ELGAR 5202 Tels. & Cables: NEOLITHIC LONDON

BARNET NON-FERROUS METAL CO.

Elektron House, Brookhill Road, New Barnet, Herts.
Phone: Barnet 5187 and 3901

STOCKISTS OF: Aluminium, Brass and Copper
BUYERS OF: all non-ferrous scrap

The RIGHT firm to deal with

RHONDDA METAL CO. LTD.

1 HAY HILL, BERKELEY, SQ., LONDON, S.W.1.
Works: PORTH, GLAM.

PHOSPHOR COPPER,
PHOSPHOR BRONZE, LEAD BRONZE,
GUNMETAL, BRASS

Telephone: MAYFAIR 4654 Cables: RONDAMET

METAL SUPPLIES Ltd

Suppliers of
PHOSPHOR COPPER
MANGANESE COPPER
and
All Other Non-Ferrous Metal Alloys

72 VICTORIA ST. LONDON S.W.1

'Phone: VICTORIA 1735 (3 lines) 'Grams: METASUPS, WESPHONE

J. LOWENSTEIN & CO. LTD.

GREENWICH HOUSE,
10/13 NEWGATE STREET, LONDON, E.C.1
Telephone: City 8401 (7 lines)

ORES - METALS - RESIDUES

NON-FERROUS ORES - METALS - SCRAP

Specializing in

NICKEL - CHROME - TUNGSTEN

MOLYBDENUM - VANADIUM - COBALT

RESIDUES - SLAGS - GRINDINGS

BY-PRODUCTS

HIGH-SPEED STEEL SCRAP

Suppliers of
segregated titanium scrap

●

COSMO METAL ALLOYS CORPORATION

ESTABLISHED 1895

Office: 150 Broadway, New York 38, N.Y.
Plant: 597-603 Kent Avenue, Brooklyn 11, N.Y.
Cable Address: 'EDELORIOUS'

MINING & CHEMICAL PRODUCTS LIMITED

86 Strand
London WC2
Telephone
Covent Garden
3393

Buyers of Ores,
Concentrates
and Residues of

BISMUTH
INDIUM
SELENIUM

THE STRAITS TRADING
COMPANY, LIMITED

Head Office :
P.O. Box 700, OCEAN BUILDING, SINGAPORE

Works:
SINGAPORE & PENANG

"The Straits Trading Co. Ltd."
Brand of Straits Tin

THE BRITISH TIN SMELTING
COMPANY LIMITED

Works : LITHERLAND, LIVERPOOL

Smelters of Non-ferrous Residues and Scrap

London Agents :

W. E. MOULSDALE & CO., LTD.
2 Chantrey House, Eccleston Street, London, S.W.1
Cables : Wemoulanco London *Telephone :* SLOane 7288/9

FRANK & SCHULTE
Handelsgesellschaft m.b.H.
(Incorporating Frank & Dieckmann G.m.b.H.)
ALFREDSTRASSE 152 POSTBOX 515
ESSEN, GERMANY
Telegrams: Silizium Teleprinter No. 0857835 Telephone: 44001

ORES MINERALS FERRO-ALLOYS
METAL-ALLOYS METALS
CHEMICALS REFRACTORIES

Established 1922

OFFERS AND AGENCIES SOLICITED

Telephone : AMHERST 2211 (six lines)

E. AUSTIN & SONS
(London) LIMITED

ATLAS WHARF
HackneyWick,London,E.9

Are Buyers of all scrap
NON-FERROUS METALS, GUNMETAL, ALUMINIUM, COPPER, BRASS, LEAD, Etc.

Manufacturers of
INGOT BRASS, GUNMETAL & COPPER ALLOYS, INGOT LEAD, TYPE METAL, ZINC, Etc.

WORLD-WIDE SERVICE

DANIEL C. GRIFFITH & CO.
ASSAYERS
TO THE BANK OF ENGLAND
27/33, PAUL STREET, LONDON, E.C.2.

Branch Office: **LEFKA, Cyprus**

Also at:
BRISTOL
BIRMINGHAM
GLASGOW
HULL
LIVERPOOL
NEWCASTLE
S. WALES

Analytical Chemists, Samplers, Technical representatives in sales of Ores & Metals at all Ports and Works.

Analyses of
PRECIOUS METALS
BASE METALS
ORES & RESIDUES
Etc.

Also in:
BELGIUM
CANADA
FRANCE
GERMANY
HOLLAND
ITALY
PORTUGAL
SPAIN
SWEDEN
SWITZERLAND
U.S.A.

Telephone: **MONARCH 1314 (3 lines)**
Telegraphic Address: **"GRYFFYDD, LONDON."**

ROURA & FORGAS, LTD. *Telephone No:* **GERRARD 9641**

Sole Sterling Area Suppliers of

ITALIAN QUICKSILVER
PRODUCED BY MONTE AMIATA, S.M.P.A.

COLQUHOUN HOUSE,
27/37 BROADWICK STREET, LONDON, W.1

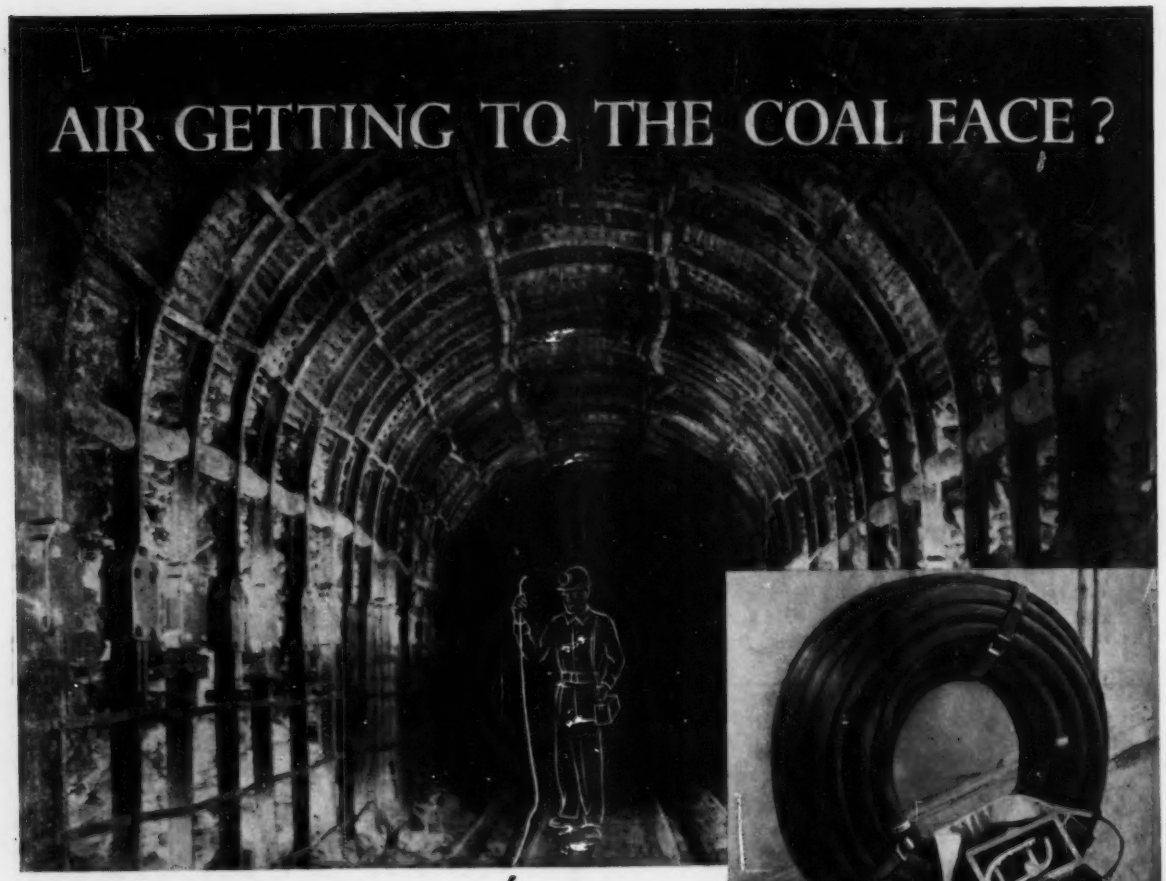
Telegrams :	*Cables :*	*Telephone :*	*International Telex*
Nonfermet Telex, London	Nonteamet London	Mansion House 4521	London 8547

HENRY GARDNER & CO. LTD.

Non-Ferrous Metals and Semi-Manufactures, Ores, Minerals and Residues, Rubber Iron and Steel and General Merchandise

2 METAL EXCHANGE BUILDINGS, LONDON, E.C.3
and at BIRMINGHAM, MANCHESTER and GLASGOW

AIR GETTING TO THE COAL FACE?



JUST SEE, with a METROVICK Pressure Survey Meter

Two men with the truly portable Metrovick outfit can conduct all pressure survey and pressure drop measurements in your colliery. Two men — for a job which has formerly required elaborate water gauge equipment and half-a-dozen operators. Metrovick pressure survey meters are easier to operate, save time, are more economical on initial costs and simplify pressure survey in coal mines. There are two range scales, 0/0.040 ins.W.G. and 0/0.6 ins.W.G. Measurements can be made down to 0.0005 ins.W.G. Write for full technical details.

METROPOLITAN-VICKERS
ELECTRICAL CO LTD · TRAFFORD PARK · MANCHESTER, 17

Member of the A.E.I. group of companies

GV 004

Published by The Mining Journal Ltd., 15 Wilson Street, Moorgate, London, E.C.2, and printed by Washburn & Sons Ltd., Queens Road Southend-on-Sea, Essex. Registered as a Newspaper.